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(54) WIRELESS COMMUNICATION APPARATUS AND PROGRAM FOR

CONTROLLING THE WIRELESS COMMUNICATION APPARATUS

1c; a contact communication use terminal 1d; a party and suitable for reducing time consumed wireless communication apparatus suitable for near distance wireless communication section communication system switching section 1f, a wireless communication apparatus comprises: first storage section 1g; a first CPU 1h; a first simply identifying a communication opposite wireless communication antenna 1b; a first PROBLEM TO BE SOLVED: To provide a contact communication section 1e; a first a first wireless control section 1a; a first SOLUTION: A first embodiment 1 of the until communication is established. (57)Abstract: され記録の記録 ほれ着の数 国政がに14年の日本 数にの(点) 会(例) た (6.2) 日コタ 机数型线板 干砂

ROM 1i; a first RAM 1j; and a first bus 1k.

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CLAIMS

[Claim(s)]

[Claim 1] The radio communication equipment characterized by having a switchable communication-mode change means for a super-short distance radio means to perform radio of a super-short distance, a short-distance radio means to perform radio of a short distance, and the radio by said super-short distance radio means and the radio by said short-distance radio means.

[Claim 2] The radio communication equipment characterized by having a switchable communication-mode change means for a super-short distance radio means to perform radio of a super-short distance, a middle distance radio means to perform middle-distance radio, and the radio by said super-short distance radio means and the radio by said middle distance radio means.

[Claim 3] The radio communication equipment according to claim 1 or 2 characterized by communicating radio information required in order to perform radio other than a communications partner and said super-short distance with said super-short distance radio means.

[Claim 4] The radio communication equipment characterized by having a switchable communication—mode change means for the antenna for radio, a radio means to perform radio of a data signal using the antenna for radio concerned, a contact terminal, the contact process means of communications that communicates said data signal through the contact terminal concerned, and the radio by said radio means and the communication link by said contact process means of communications.

[Claim 5] The radio communication equipment according to claim 4 characterized by communicating radio information required in order for a communications partner and said radio means to perform radio by said contact process means of communications.

[Claim 6] The radio communication equipment characterized by having a switchable

communication-mode change means for a communications partner, the electromagnetic means of communications which performs radio of said data signal by electromagnetic induction, and the radio by said radio means and the radio by said electromagnetic means of communications using the antenna for radio, a radio means to perform radio of a data signal using the antenna for radio concerned, a coil, and the coil concerned.

[Claim 7] The radio communication equipment according to claim 6 characterized by communicating radio information required in order for said communications partner and said radio means to perform radio by said electromagnetic means of communications.

[Claim 8] The antenna for short-distance radio, the antenna for super-short distance radio, and a contact terminal, When the contact terminal of other equipments contacts a radio means to perform radio using either among said antenna for short-distance radio, and said antenna for super-short distance radio, and said contact terminal of self-equipment The radio communication equipment characterized by having the antenna change means which changes automatically the antenna which said radio means uses to said antenna for super-short distance radio.

[Claim 9] Said radio means is a radio communication equipment according to claim 8 characterized by having the signal amplifier which amplifies the data signal outputted from said antenna.

[Claim 10] Said radio means is a radio communication equipment according to claim 9 characterized by amplifying said data signal by said signal amplifier only in the radio which used said antenna for short-distance radio.

[Glaim 11] The radio communication equipment according to claim 8 to 10 characterized by performing the communication link of radio information required in order for a communications partner and said radio means to perform radio by the radio using said antenna for super-short distance radio.

[Claim 12] The radio communications system characterized by having a radio communication equipment according to claim 1 to 11 two or more, communicating the information for radio required in order to perform the communications partner and radio using the acquired radio information concerned by the radio of a super-short distance.
[Claim 13] The super-short distance radio step which is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 1, and performs radio processing of a super-short distance with said super-short distance radio means, The short-distance radio step which performs

radio processing of a short distance with said short-distance radio means, The communications processing change step which performs change processing with the super-short distance radio processing by said super-short distance radio step, and the short-distance radio processing by said short-distance radio step with said communication-mode change means, The program for radio device control characterized by preparation *******

[Claim 14] The super-short distance radio step which is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 2, and performs radio processing of a super-short distance with said super-short distance radio means, The middle-distance radio processing with said middle distance radio means, The communications processing change step which performs change processing with the super-short distance radio processing by said super-short distance radio step, and the middle distance radio processing by said middle distance radio step with said communication-mode change means, The program for radio device control characterized by preparation *******

[Claim 15] The program for radio device control according to claim 13 or 14 characterized by performing the communication link of radio information required in order to perform radio other than a communications partner and said super-short distance in said super-short distance radio step.

[Claim 16] It is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 4. The radio step which performs radio processing of a data signal performed using said antenna for radio by said radio means. The contact process communication link step which performs the communications processing of said data signal performed by said contact process means of communications through said contact terminal. The program for radio device control characterized by having the communications processing change step which performs change processing with the radio processing by said radio step, and the communications processing by said contact process communication link step with said communication—mode change means.

[Claim 17] The radio communication equipment according to claim 16 characterized by performing the communications processing of radio information required for the radio processing performed in a communications partner and said radio step in said contact process communication link step.

[Claim 18] It is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 6. The radio step which

performs radio processing of a data signal performed using said antenna for radio by said radio means. The electromagnetic communication link step which performs radio processing of said data signal performed by the electromagnetic induction using a coil by said electromagnetic means of communications, The program for radio device control characterized by having the communications processing change step which performs change processing with the radio processing by said radio step, and the radio processing by said electromagnetic communication link step with said communication—mode change means.

[Claim 19] The program for radio device control according to claim 18 characterized by performing the communications processing of radio information required for the radio processing performed in said communications partner and said radio step in said electromagnetic communication link step.

[Claim 20] It is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 6. The radio step which performs radio processing performed by said radio means using either among said antenna for short-distance radio, and said antenna for super-short distance radio, The radio processing change step which changes automatically the radio processing performed in said radio step to super-short distance radio was used when the contact terminal of other equipments contacts said contact terminal of self-equipment, The program for radio device control characterized by preparation **********.

[Claim 21] The radio communication equipment according to claim 20 characterized by performing signal magnification processing which amplifies the data signal outputted from said antenna in said radio step.

[Claim 22] The program for radio device control according to claim 21 characterized by performing said signal magnification processing only in the radio using said antenna for short—distance radio in said radio step.

Claim 23] The program for radio device control according to claim 20 to 22 characterized by performing the communications processing of radio information required for the radio processing performed in a communications partner and said radio step using said antenna for super-short distance radio.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

. . [Field of the Invention] This invention relates to the equipment which transmits and receives a data signal by wireless, especially, specifies a communications partner simply and relates to a suitable radio communication equipment to bring forward the time amount to communication link initiation.

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[Description of the Prior Art] I had the information on the device required [when not knowing the device ID of the partner who wants to connect] of the conventional radio in order to perform radio, such as Device ID, to all the devices that exist within limits which a wireless electric wave reaches transmitted, those information was received, and the approach which a user chooses a communications partner from the inside, and connects was used.

993

[Problem(s) to be Solved by the Invention] However, by the above-mentioned conventional approach, when there are many devices for a communication link on the outskirts, while it is necessary to choose the target communications partner and selection of a device becomes a troublesome activity out of many received devices ID, in order to do the activity which chooses reception and a communications partner from all the devices of communication link within the limits for information, there is a problem that time amount is light by communication link initiation.

[0004] Then, this invention is made paying attention to the unsolved technical problem which such a Prior art has, and it aims at offering a suitable radio communication equipment shortening time amount until a communication link is established, and the program for radio equipment control while it is suitable to specify a communications

partner simply.

3005]

Means for Solving the Problem] In order to attain the above-mentioned purpose, the consumption, compaction of the time amount to data communication initiation, etc. by short-distance radio means to perform radio of a short distance, and the radio by said using the communication mode according to a communication link application properly. middle-distance radio, and the radio by said super-short distance radio means and the Further with a communication-mode change means Since it is possible to change to super-short distance radio means and the radio by said short-distance radio means. radio by short-distance means of communications, it is useful to reduction of power communicate the data signal in a short distance with a short-distance radio means. 0006] With such a configuration, it is possible to communicate the data signal in a distance of a super-short distance to several m. Moreover, a radio communication perform radio of a super-short distance, a middle distance radio means to perform he communication link by super-short distance means of communications or the [0007] Here, suppose that a super-short distance is the distance from a contact radio communication equipment according to claim 1 concerning this invention is uper-short distance radio means to perform radio of a super-short distance, a characterized by having a switchable communication-mode change means for a super-short distance with a super-short distance radio means. It is possible to communication-mode change means for a super-short distance radio means to ocation to several cm, and a short distance is the distance from the maximum equipment according to claim 2 is characterized by having a switchable radio by said middle distance radio means.

[0008] That is, it is possible to communicate the data signal in a super-short distance with a super-short distance radio means. It is possible to communicate a middle-distance data signal with a middle distance radio means. Further with a communication-mode change means Since it is possible to change to the communication link by super-short distance means of communications or the radio by middle distance means of communications, it is useful to reduction of power consumption, compaction of the time amount to data communication initiation, etc. by using the communication mode according to a communication link application properly. [0009] Here, suppose that middle distance is the distance from the maximum distance of a short distance to dozens of meters. Moreover, it is characterized by communicating radio information required in order that invention concerning claim 3 may perform radio other than a communications partner and said super-short

distance in a radio communication equipment according to claim 1 or 2 with said super-short distance radio means.

[0010] That is, it is characterized by communicating radio information required in order for a communications partner and said radio means to perform radio by said contact process means of communications. That is, it was made to communicate with a super-short distance radio means about radio information required in order to perform radio [say / receiving the proper ID for identifying a communications partner required in order to perform radio etc. from a communications partner, or notifying the discernment ID of a self-equipment proper etc. to a communications partner conversely]. Therefore, since it becomes the communication link of a super-short distance, while preventing transmitting the password and identification information of equipment to unrelated equipment, it is useful to becoming possible to start radio easily and shortening the time amount to communication link initiation using the acquired radio information.

[0011] Moreover, the radio communication equipment according to claim 4 is characterized by having a switchable communication-mode change means for the antenna for radio, a radio means to perform radio of a data signal using the antenna for radio concerned, a contact terminal, the contact process means of communications that communicates said data signal through the contact terminal concerned, and the radio by said radio means and the communication link by said contact process means of communications.

[0012] Since with such a configuration it is possible to perform radio using the antenna for radio with a radio means, it is possible to perform the communication link which minded the contact terminal by contact process means of communications and it is still more possible to change the radio by the radio means or the communication link by contact process means of communications with a communication—mode change means, proper use of the communication mode according to a communication link application can be performed, and it is convenient. Moreover, it is characterized by communicating radio information required in order that invention concerning claim 5 may perform radio with a communications partner and said radio means in a radio communication equipment according to claim 4 by said contact process means of communications.

[0013] That is, it was made to communicate by contact process means of communications about radio information required in order to perform radio [say / receiving the proper ID for identifying a communications partner required in order to perform radio etc. from a communications partner, or notifying the discernment ID of a

self-equipment proper etc. to a communications partner conversely]. Therefore, since it becomes the communication link of 1 to 1 by contact, while preventing transmitting the password and identification information of equipment to unrelated equipment, it is useful to becoming possible to start radio easily and shortening the time amount to communication link initiation using the acquired radio information. [0014] Moreover, the radio communication equipment according to claim 6 is characterized by having a switchable communication—mode change means for a communications partner, the electromagnetic means of communications which performs radio of said data signal by electromagnetic induction, and the radio by said radio means and the radio by said electromagnetic means of communications using the antenna for radio, a radio means to perform radio of a data signal using the antenna for radio concerned, a coil, and the coil concerned.

[0015] That is, electromagnetic means of communications is made to perform radio by the electromagnetic induction using a coil. Since this method can be communicated by little power consumption, it is using properly with the radio by the antenna for radio by the application, and it becomes possible to reduce power consumption. Moreover, it is characterized by communicating radio information required in order that invention concerning claim 7 may perform radio with said communications partner and said radio means in a radio communication equipment according to claim 6 by said electromagnetic means of communications.

[0016] That is, it was made to communicate by electromagnetic means of communications about the radio information that receive the proper ID for identifying a communications partner required in order for a radio means to perform radio etc. from a communications partner, or the discernment ID of a self-equipment proper etc. is conversely notified to a communications partner. Therefore, it is useful to becoming possible to start radio easily and bringing forward the time amount to initiation of radio using the acquired radio information, while it reduces transmitting the password and identification information of equipment to another unrelated equipment, since the radio by electromagnetic induction turns into a communication link of a short distance extremely.

[0017] Moreover, the radio communication equipment according to claim 8 concerning this invention The antenna for short-distance radio, the antenna for super-short distance radio, and a contact terminal, When the contact terminal of other equipments contacts a radio means to perform radio using either among said antenna for short-distance radio, and said antenna for super-short distance radio, and said contact terminal of self-equipment it is characterized by having the antenna change

means which changes automatically the antenna which said radio means uses to said antenna for super-short distance radio.

[0018] The short-distance radio which used the antenna for short-distance radio with the radio means when it was such a configuration, When it is possible to perform super-short distance radio using the antenna for super-short distance radio and the contact terminal of other equipments contacts the contact terminal of self-equipment further Since the antenna which a radio means uses is automatically changed to the antenna for super-short distance radio with an antenna change means If the equipment is equipment is equipments which exist close at hand, super-short distance radio communication equipments which exist close at hand, super-short distance radio can be performed only by contacting the contact terminals, and it is convenient.

[0019] Moreover, invention concerning claim 9 is characterized by equipping said radio means with the signal amplifier which amplifies the data signal outputted from said antenna in the radio communication equipment according to claim 8. That is, a radio means amplifies the data signal outputted from an antenna by the signal amplifier. Moreover, invention concerning claim 10 is characterized by said radio means amplifying said data signal by said signal amplifier only in the radio which used said antenna for short-distance radio in the radio communication equipment according to claim 9.

[0020] That is, in the radio using the antenna for super-short distance radio of a super-short distance, a radio means is outputted from an antenna, without amplifying the data signal by the signal amplifier, and is useful to holding down consumption of useless power. Moreover, it is characterized by performing the communication link of radio information required in order that invention concerning claim 11 may perform radio with a communications partner and said radio means in a radio communication equipment according to claim 8 to 10 by the radio using said antenna for short-distance radio.

[0021] That is, the radio using the antenna for super-short distance radio was made to perform the communication link of the radio information that receive the proper ID for identifying a communications partner required in order for a radio means to perform radio etc. from a communications partner, or the discernment ID of a self-equipment proper etc. is conversely notified to a communications partner. Therefore, since it becomes the communication link of a short distance extremely, while reducing transmitting the password and identification information of equipment to another unrelated equipment, it is useful to becoming possible to start

.0022] Moreover, the radio communications system according to claim 12 concerning perform a communications partner and radio, and is characterized by performing said which performs change processing with the super-short distance radio processing by said super-short distance radio step, and the short-distance radio processing by said which performs change processing with the super-short distance radio processing by said super-short distance radio step, and the middle distance radio processing by said step. Moreover, the program for radio device control according to claim 16 concerning he radio of a super-short distance. That is, it is the system which performs radio with concerning this invention The super-short distance radio step which is a program for concerning this invention The super-short distance radio step which is a program for other than a communications partner and said super-short distance in the program for short-distance radio easily, and bringing forward the time amount to the improvement communications partner and radio using the acquired radio information concerned by Jistance with said super-short distance radio means, The middle distance radio step his invention is equipped with a radio communication equipment according to claim he said equipments using a radio communication equipment according to claim 1 to distance with said super-short distance radio means, The short-distance radio step nformation required in order that invention concerning claim 15 may perform radio which performs radio processing of a short distance with said short-distance radio radio device control according to claim 13 or 14 in said super-short distance radio [0025] Moreover, it is characterized by performing the communication link of radio adio device control for controlling the radio processing in a radio communication neans, It is characterized by having the communications processing change step adio device control for controlling the radio processing in a radio communication means, It is characterized by having the communications processing change step which performs middle-distance radio processing with said middle distance radio equipment according to claim 1, and performs radio processing of a super-short equipment according to claim 2, and performs radio processing of a super-short to 11 two or more, communicates the information for radio required in order to this invention It is a program for radio device control for controlling the radio 0023] Moreover, the program for radio device control according to claim 13 (0024) Moreover, the program for radio device control according to claim 14 middle distance radio step with said communication-mode change means. short-distance radio step with said communication-mode change means. 11, and since the operation effectiveness overlaps, it omits a publication. in security, and initiation of radio using the acquired radio information.

processing in a radio communication equipment according to claim 4. The radio step which performs radio processing of a data signal performed using said antenna for radio by said radio means, The contact process communication link step which performs the communications processing of said data signal performed by said contact process means of communications through said contact terminal. It is characterized by having the communications processing change step which performs change processing with the radio processing by said radio step, and the communications processing by said contact process communication link step with said communication—mode change means.

[0026] Moreover, invention concerning claim 17 is characterized by performing the communications processing of radio information required for the radio processing performed in a communications partner and said radio step in said contact process communication link step in the program for radio device control according to claim 18 concerning this invention It is a program for radio device control according to claim 18 concerning this invention It is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 6. The radio step which performs radio processing of a data signal performed using said antenna for radio by said radio means. The electromagnetic communication link step which performs radio processing of said data signal performed by the electromagnetic induction using a coil by said electromagnetic means of communications, It is characterized by having the communications processing by said radio step, and the radio processing by said electromagnetic communication link step with said communication—mode change means.

[0027] Moreover, invention concerning claim 19 is characterized by performing the communications processing of radio information required for the radio processing performed in said communications partner and said radio step in said electromagnetic communication link step in the program for radio device control according to claim 18. Moreover, the program for radio device control for controlling the radio processing in a radio communication equipment according to claim 6. The radio step which performs radio processing performed by said radio means using either among said antenna for short-distance radio, and said antenna for super-short distance radio, The radio processing change step which changes automatically the radio processing performed in said radio step to super-short distance radio processing in which said antenna for super-short distance radio was used when the contact terminal of other equipments contacts said contact terminal of self-equipment, it is characterized by preparation

[0028] Moreover, invention concerning claim 21 is characterized by performing signal magnification processing which amplifies the data signal outputted from said antenna by said signal amplifier in said radio step in the program for radio device control according to claim 20. Moreover, it is characterized by invention concerning claim 22 performing said signal magnification processing only in the radio using said antenna for short-distance radio in said radio step in the program for radio control according to claim 21.

[0029] Moreover, invention concerning claim 23 is characterized by performing the communications processing of radio information required for the radio processing performed in a communications partner and said radio step in the radio step using said antenna for super-short distance radio in the program for radio device control according to claim 20 to 22. The program for radio device control according to claim 13 to 23 is a program for controlling the radio processing in a radio communication equipment according to claim 1 to 9 here, and since the effectiveness overlaps, it omits a publication.

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. <u>Drawing 1</u> thru/or <u>drawing 9</u> are drawings showing the gestalt of operation of the radio communication equipment concerning this invention. First, the 1st example of a configuration of the radio communication equipment concerning this invention is explained based on <u>drawing 1</u>. <u>Drawing 1</u> is the block diagram showing the 1st example of a configuration of the radio communication equipment concerning this invention. As shown in <u>drawing 1</u>, the 1st example 1 of a configuration of a radio communication equipment 1st radio control section 1a, 1st antenna 1b for radio, and 1st short-distance Radio Communications Department 1c, it has composition equipped with 1d of terminals for a contact communication link, contact process communications department 1e, 1f of 1st communication-mode change section, 1g of 1st storage section and 1st CPU1h, 1st ROM1i, 1st RAM1j, and 1st bus 1k.

[0031] 1st radio control-section 1a controls radio processing, and performs generation of the transmission data in the transmitting processing and reception of a data signal by wireless, and transmission of a processing instruction. 1st antenna 1b for radio is an antenna for performing radio of a short distance. 1st short-distance Radio Communications Department 1c performs processing which outputs the data for transmission from 1st antenna 1for radio b to a short distance according to the

instruction from 1st radio control-section 1a.

[0032] Id of terminals for a contact communication link is for transmitting data by contact for the same terminal of other equipments. Contact process communications department 1e is for performing data transceiver processing between other communication equipment through 1d of terminals for a contact communication link, and processes a monitor, data transmission processing, etc. of a contact condition. If of 1st communication-mode change section is for carrying out control which changes the short-distance radio by 1st short-distance Radio Communications Department 1c, and the communication link by contact process communications department 1e, and performs only one processing according to the communicate mode set up by actuation of the control unit which is not illustrated.

[0033] Ig of 1st storage section is for memorizing the data transmitted and received by the communication link through radio or 1d of terminals for a contact communication link. 1st CPU1h is for performing the program for control memorized by 1st ROM1i for controlling processing of each part of the above. 1st ROM1i has memorized the above-mentioned program for control, and also has memorized the identification information of an equipment proper etc.

[0034] 1st RAMIj is for memorizing required data, in case 1st CPU1h performs the above-mentioned program for control. 1st bus 1k is a data communication way for performing data communication between each part of the above. Next, more concrete actuation is explained based on <u>drawing 4</u>. <u>Drawing 4</u> is drawing showing signs that the communication devices of the same type are performing radio, (a) is drawing showing the situation of radio using 1d of terminals for a contact communication link by contact process communications department 1e, and (b) is drawing showing the situation of radio using the 1st antenna for radio by 1st short-distance Radio Communications Department 1c.

[0035] First, the communication link using 1d of terminals for a contact communication link is performed by contacting 1st terminal 40a for a contact communication link of the 1st radio communication equipment 40, and 2nd terminal 41a for a contact communication link of the 2nd radio communication equipment 41, as shown in <u>drawing 4</u> (a). In the gestalt of this operation, transmission and reception of the information for a communication link required in order to communicate with a communications partner to perform short-distance radio by this terminal for a contact communication link will be performed.

[0036] Furthermore, as information for a communication link, information, such as identification information of the equipment proper memorized by 1st ROM1i and a

7. Drawing 7 is a flow chart which shows processing of the program for control in the 1st example 1 of a configuration of a radio communication equipment of operation. As from 1st ROM1i by contact process communications department 1e, and transmission communication link information on the acquired communications partner and performs [0037] Furthermore, the flow of actuation of the control program in the 1st example 1 terminals for a contact communication link judged and contacted [whether the same Department 1c reads the data to transmit from the 1st storage section based on the of a configuration of a radio communication equipment is explained based on drawing contacted, and] (Yes), it shifts to step S708, and when that is not right, (No) stands communication-mode change section, and it shifts to step S704 by it so that it may nodulation processing etc., as shown in drawing 4 (b), it will perform short-distance shown in <u>drawing 7</u> , it shifts to step S700 first, and by the control unit which is not communications processing by contact process communications department 1e will protocol of short-distance radio, is transmitted and received beforehand, it is read contact process communications department 1e. Furthermore, if a communication communication mode will be performed by 1f of 1st communication-mode change Communications Department 1c, after 1st short-distance Radio Communications be started, and it will shift to step S706. At step S706, when it judges that 1d of ROM1's memorizing and performing the program for *** control by 1st CPU1h. illustrated, it is set as the super-short distance radio mode in which the contact Communications Department 1c from the super-short distance radio method by communications partner is acquired by this communication link, the change of a node changes to the short-distance radio method by 1st short-distance Radio become the communication mode for which the communication mode used the terminal for a contact communication link of other communication devices was terminal for a communication link according a communication mode to contact adio processing which outputs the data signal modulated from the antenna of self-equipment. In addition, processing of these each part is performed by 1st process communications department 1e was used, and shifts to step S702. section in the short-distance radio method by 1st short-distance Radio processing is performed. And if the communication link information on a contact terminal for a communication link. If it shifts to step S704, the [0038] At step S702, change processing is performed by 1f of 1st by until it contacts.

[0039] Since contact was checked when it shifted to step S708, transceiver processing of communication link information is performed, and further, it judges

acquired, and when judged with having acquired communication link information (Yes), contacts and acquires the information for a communication link. In the gestalt of this short-distance radio mode, and shifts to step S712. At step S712, change processing whether the information for a communication link from a communications partner was self-equipment to a communications partner, and after both are in the condition with the data signal is compounded with a subcarrier, and is performed with changing into is performed by 1f of 1st communication-mode change section, and it shifts to step method by 1st short-distance Radio Communications Department 1c. At step S714, operation here, the information for a communication link also transmits the thing of it shifts to step S710, and when that is not right, (No) continues processing until it storage section, and short-distance radio performs modulation processing to which [0040] When it shifts to step S710, a communication mode is automatically set as Radio Communications Department 1c reads the data to transmit from 1g of 1st short-distance Radio Communications Department 1c. Here, 1st short-distance the short-distance radio which used the 1st antenna for radio is started by 1st S714 by it so that a communication mode may turn into a short-distance radio the mutual information for a communication link, it shifts to the following step. the data for transmission and outputting from 1st antenna 1for radio b.

[0041] Furthermore, the 2nd example of a configuration of the radio communication equipment concerning this invention is explained based on <u>drawing 2</u>. <u>Drawing 2</u> is the block diagram showing the 2nd example of a configuration of the radio communication equipment concerning this invention. As shown in <u>drawing 2</u>, the 2nd example 2 of a configuration of a radio communication equipment With 2nd radio control section 2a, the 2nd antenna 2 for radio, and the 2nd short distance Radio Communications
Department 2 it has composition equipped with coil 2d for radio, electromagnetic Radio Communications Department 2e, 2f of 2nd communication-mode change section, 2g of 2nd storage section and 2nd CPU2h, 2nd ROM2i, 2nd RAM2j, and 2nd bus 2k.

[0042] 2nd radio control-section 2a controls radio processing, and performs generation of the transmission data in the transmitting processing and reception of a data signal by wireless, and transmission of a processing instruction. 2nd antenna 2b for radio is an antenna for performing radio of a short distance. 2nd short-distance Radio Communications Department 2c performs processing which outputs the data for transmission from 2nd antenna 2b for radio to a short distance according to the instruction from 2nd radio control-section 2a.

(0043] Coil 2d for radio is for causing electromagnetic induction and carrying out the

radio transmission of the data by approach with the same coil. Electromagnetic Radio Communications Department 2e performs processing for transmitting data to other communication equipment using the electromagnetic induction by coil 2d for radio, and performs processing for transmitting and receiving data by electromagnetic induction. 2f of 2nd communication-mode change section is for carrying out control which changes the short-distance radio by 2nd short-distance Radio Communications Department 2c, and the super-short distance radio by electromagnetic Radio Communications Department 2e, and is made to perform only one processing according to the communicate mode set up by actuation of the control unit which is not illustrated.

[0044] 2g of 2nd storage section is for memorizing the data transmitted and received by the super-short distance radio which used short-distance radio and coil 2d for radio which used 2nd antenna 2b for radio. 2nd CPU2h is for performing the program for control memorized by 2nd ROM2i for controlling processing of each part of the above. 2nd ROM2i has memorized the above-mentioned program for control, and also has memorized the identification information of an equipment proper.

[0045] 2nd RAM2j is for memorizing required data, in case 1st CPU2h performs the above-mentioned program for control. 2nd bus 2k is a data communication way for performing data communication between each part of the above. Next, more concrete actuation is explained based on <u>drawing 5</u>. <u>Drawing 5</u> is drawing showing signs that radio by the communication devices of the same type is performed, (a) is drawing showing the communicative situation using coil 2d for radio by electromagnetic communications department 2e, and (b) is drawing showing the situation of radio using 2nd antenna 2b for radio by 2nd short-distance Radio Communications Department

[0046] First, the communication link using coil 2d for radio is performed by bringing 1st output section 50a of the 3rd radio communication equipment 50, and 2nd output section 51a of the 4th radio communication equipment 51 close to the distance which can communicate, as shown in <u>drawing 5</u> (a). In the gestalt of this operation, transmission and reception of communication link information required in order to perform a target communications partner and short-distance radio will be performed by the radio using electromagnetic induction with this coil for radio. In order to perform a radio transmission, modulation processing etc. is performed, and the data of the information for a communication link which information, such as identification information of the equipment proper memorized by 2nd ROM2i and a communicative protocol, was beforehand transmitted as communication link information, and was read

from 2nd ROM2! by electromagnetic Radio Communications Department 2e are transmitted to a phase hand through coil 2d for radio.

[0047] And if the communication link information on a communications partner is acquired by the super-short distance radio by electromagnetic Radio Communications Department 2e, the change of a communication mode will be performed by 2f of 2nd communication-mode change section in the short-distance radio method by 1st short-distance Radio Communications Department 2c from the super-short distance radio method by electromagnetic Radio Communications Department 2c from the super-short distance radio method by electromagnetic Radio Communications Department 2c, after 2nd short-distance Radio Communications Department 2c, after 2nd short-distance Radio Communications Department 2c reads the data to transmit from 2g of 2nd storage section based on the communication link information on the communications partner acquired by super-short distance radio and performs modulation processing etc., as shown in drawing 5 (b), it will perform the short-distance radio processing which outputs the data signal modulated from the antenna of self-equipment. In addition, processing of these each part is performed by 2nd ROM2i's memorizing and performing the program for **** control by 2nd CPU2h.

[0048] Furthermore, the flow of actuation of the control program in the 2nd example 2 of a configuration of a radio communication equipment is explained based on <u>drawing</u> 8. <u>Orawing</u> 8 is a flow chart which shows processing of the program for control in the 2nd example 2 of a configuration of a radio communication equipment of operation. As shown in <u>drawing</u> 8, it shifts to step S800 first, and by the control unit which is not illustrated, it is set as the super-short distance radio mode in which coil 2d for radio according a communication mode to electromagnetic Radio Communications
Department 2e was used, and shifts to step S802.

[0049] At step S802, change processing is performed by 2f of 2nd communication-mode change section, and it shifts to step S804 by it so that it may become the super-short distance radio method with which the communication mode used coil 2d for radio. If it shifts to step S804, the super-short distance radio processing by electromagnetic Radio Communications Department 2e will be started, and it will shift to step S806. At step S806, when judged with coil 2d for radio having judged whether it moved within limits which can radiocommunicate by electromagnetic induction with the same coil for radio of other communication devices, and having moved (Yes), it shifts to step S808, and when that is not right, (No) stands by until it moves to within the limits.

[0050] Since the migration to within the limits was checked when it shifted to step

S808, transceiver processing of the information for a communication link is performed, and further, it judges whether the information for a communication link from a communications partner was acquired, and processing is continued until it shifts to step S810 when judged with having acquired communication link information (Yes), (No) moves to within the limits when that is not right, and it acquires the information for a communication link. In the gestalt of this operation here, the information for a communication link also transmits the thing of self-equipment to a communications partner, and after both are in the condition with the mutual information for a communication link, it shifts to the following step.

[0051] When it shifts to step S810, a communication mode is automatically set as short-distance radio mode, and shifts to step S812. At step S812, change processing is performed by 2f of 2nd communication-mode change section, and it shifts to step S814 by it so that a communication mode may turn into a short-distance radio method by 2nd short-distance Radio Communications Department 2c. At step S814, the short-distance radio which used 2nd antenna 2b for radio is started by 2nd short-distance Radio Communications Department 2c. Here, 2nd short-distance Radio Communications Department 2c reads the data to transmit from 2g of 2nd storage section, and short-distance radio performs modulation processing to which the data signal is compounded with a subcarrier, and is performed with changing into the data for transmission and outputting from 2nd antenna 2b for radio.

[0052] Furthermore, the 3rd example of a configuration of the radio communication equipment concerning this invention is explained based on <u>drawing 3</u>. <u>Drawing 3</u> is the block diagram showing the 3rd example of a configuration of the radio communication equipment concerning this invention. As shown in <u>drawing 3</u>, the 3rd example 3 of a configuration of a radio communication equipment. The 3rd radio control-section 3a, Radio Communications Department 3b, and antenna 3c for super-short distance radio, it has composition equipped with antenna 3d for short-distance radio, antenna change section 3e, 3f of signal amplifiers, 3g of 3rd storage section and 3rd CPU3h, 3rd ROM3i, 3rd RAM3i, and 3rd bus 3k.

[0053] 3rd radio control-section 3a controls the communications processing of the data based on wireless, and performs control of transmitting processing or reception, generation of the data for a communication link, etc. Radio Communications
Department 3b performs radio using antenna 3for super-short distance radio c, or antenna 3d for short-distance radio, and processes based on the control instruction from 3rd radio control-section 3a. Antenna 3c for super-short distance radio is an antenna for performing the communications partner and super-short distance radio

which are performed when the contact terminal of other equipments contacts the contact terminal of the self-equipment which is not illustrated.

[0054] Antenna 3d for short-distance radio is an antenna for performing the communications partner and the short-distance radio of the purpose. Antenna change section 3e changes an antenna to antenna 3c for super-short distance radio automatically, when the contact terminal of other equipments contacts the contact terminal of self-equipment, and when performing radio of a short distance radio. Here, according to the existence of contact of a contact terminal, and the acquisition situation of communication link information, an antenna is changed automatically. [0055] 3f of signal amplifiers is for amplifying the signal outputted from antenna 3d for short-distance radio. When performing super-short distance radio which used antenna 3c for super-short distance radio in the gestalt of this operation here, it outputs from an antenna, without amplifying a signal. 3g of 3rd storage section is for memorizing the data transmitted and received by super-short distance radio and short-distance radio.

[0056] 3rd CPU3h is for performing the program for control memorized by 3rd ROM3i for controlling processing of each part of the above. 3rd ROM3i has memorized the above-mentioned program for control, and also has memorized the identification information of an equipment proper, and information for a communication link, such as a password. 3rd RAM3j is for memorizing required data, in case 3rd CPU3h performs the above-mentioned program for control.

[0057] 3rd bus 3k is a data communication way for performing data communication between each part of the above. Next, more concrete actuation is explained based on <u>drawing 6</u>. <u>Drawing 6</u> is drawing showing signs that radio by the communication devices of the same type which have a contact terminal is performed, (a) is drawing showing the situation using antenna 3c for super-short distance radio of super-short distance radio, and (b) is drawing showing the situation using antenna 3d for short-distance radio of short-distance radio.

[0058] First, radio mode is set up by actuation of the control unit which is not illustrated. 3rd radio control-section 3a transmits mode information to antenna change section 3e according to this mode setting. Here, when the contact terminal of self-equipment touches the contact terminal of other equipments, processing which chooses antenna 3c for super-short distance radio by antenna change section 3e is performed. If Radio Communications Department 3b is the radio of a super-short distance in the gestalt of this operation, transmitting processing of the data for

transmission (here information for a communication link) will be performed without minding 3f of signal amplifiers.

ink information is acquisition ending, antenna change section 3e chooses antenna 3d signal for transmission amplify in 3f of signal amplifiers, and outputs the data signal for equipment 60, and 4th terminal 61a for a contact communication link of the 6th radio etc. is performed, and the data of the information for a communication link read from 3rd ROM3i are outputted by Radio Communications Department 3b from antenna 3for for short-distance radio, and Radio Communications Department 3b makes the data link using antenna 3c for super-short distance radio is performed by contacting 3rd contact terminal of other equipments, and does not shine, and when communication transmission from antenna 3d for short-distance radio. That is, the communication communications partner and short-distance radio will be performed. As information control-section 3a In order to perform a radio transmission, modulation processing operation, transmission and reception of the information for a communication link for a communication link, the information on the identification information of the [0059] On the other hand, the contact terminal of self-equipment contacts the terminal 60a for a contact communication link of the 5th radio communication communication equipment 61, as shown in drawing 6 (a). In the gestalt of this communication link authorization, etc. is transmitted beforehand. By 3rd radio required in order for this super-short distance radio to perform a target equipment proper memorized by 3rd ROM2i, the password for obtaining super-short distance radio c.

[0060] And when acquiring the information for a communication link and performing a communications partner and short-distance radio As antenna 3d for short-distance radio is chosen by antenna change section 3e and it is shown in <u>drawing 6</u> (b) The 5th radio communication equipment 60 and 6th radio communication equipment 61 are in the condition of having separated mutually within the limits of the short distance, and short-distance radio is performed with outputting the signal amplified by Radio Communications Department 3b from antenna 3d for short-distance radio through 3f of signal amplifiers.

[0061] Furthermore, the flow of actuation of the control program in the 3rd example 3 of a configuration of a radio communication equipment is explained based on drawing 10. Drawing 9 is a flow chart which shows processing of the program for control in the 3rd example 3 of a configuration of a radio communication equipment of operation. As shown in <u>drawing 9</u>, when it shifts to step S900 first, it judges whether there was any contact of contact terminals and there is contact (Yes), it shifts to step S902, and

when that is not right, (No) shifts to step S908.

[0062] When it shifts to step S902, antenna 3c for super-short distance radio is chosen by antenna change section 3e, and it shifts to step S904 by it. If it shifts to step S904, by Radio Communications Department 3b, super-short distance radio using antenna 3c for super-short distance radio will be performed, and it will shift to step S906. At step S906, when judged with having judged whether radio was completed or not and having ended (Yes), communications processing is ended, and when that is not right, (No) shifts to step S900.

[0063] When judged with on the other hand judging and acquiring whether the information for a communication link is acquired when there is no contact of a contact terminal and it shifts to step S908 at step S900 (Yes), it shifts to step S910, and when that is not right, (No) shifts to step S900. If it shifts to step S910, by antenna change section 3e, antenna 3d for short-distance radio will be chosen as an antenna which Radio Communications Department 3b uses, and it will shift to step S912.

[0064] At step S912, by Radio Communications Department 3b, short-distance radio using antenna 3d for short-distance radio is performed, and it shifts to step S906. As mentioned above, since it becomes possible to reduce that those information is received by unrelated equipment since according to the gestalt of the above-mentioned implementation the radio of a super-short distance is made to perform the discernment data of a communication device proper, and transmission and reception of a password in case radio is performed, it is useful to improvement in security.

[0065] Moreover, since the information for a communication link is quickly [simply and] acquirable in the 1st example 1 of a configuration which acquired the information for a communication link by the super-short distance communication link by 1d of terminals for a contact communication link, it is possible to shorten the time amount to radio initiation. Moreover, since the information for a communication link is simply acquirable in the 2nd example 2 of a configuration which acquired the information for a communication link by the super-short distance communication link by coil 2d for radio, it is possible to shorten the time amount to radio initiation.

[0066] Moreover, since it communicates by changing to the antenna for super-short distance radio automatically when there is contact of a contact terminal in the 3rd example 3 of a configuration which changed the class of antenna used for a communication link according to the existence of contact of a contact terminal, the information for a communication link can be acquired simply and quickly, the time amount to radio initiation can be shortened, and it is convenient. Moreover, in the 3rd

example 3 of a configuration, since he is trying to output from an antenna at the time of the super-short distance radio using the antenna for super-short distance radio, without amplifying a signal, it becomes reduction of power consumption. [0067] The short-distance radio processing by 1st radio control section 1a and 1st short-distance Radio Communications Department 1c which are shown in <u>drawing 1</u> here it corresponds to a short-distance radio means according to claim 4. 1st antenna 1b for radio it corresponds to the antenna for radio according to claim 4. 1d of terminals for a contact communication link it corresponds to a contact terminal according to claim 4, contact process communications department 1e corresponds to claim 4 and contact process means of communications according to claim 5, and 1f of 1st communication-mode change section supports claims 1 and 4 and the communication-mode change means of five

[0068] Furthermore, the short-distance radio processing by 2nd radio control section 2a and 2nd short-distance Radio Communications Department 2c which are shown in drawing 2 it corresponds to a short-distance radio means according to claim 1 and claim 6, and the radio means of seven publications. 2nd antenna 2b for radio It corresponds to the antenna for radio according to claim 6. Coil 2d for radio It corresponds to a coil according to claim 6, electromagnetic Radio Communications Department 2e corresponds to claim 6 and electromagnetic means of communications according to claim 7, and 2f of 2nd communication-mode change section corresponds to claims 1 and 4 and the communication-mode change means of six publications. [0069] Furthermore, the radio by the 3rd radio control-section 3a and Radio Communications Department 3b which are shown in <u>drawing 3</u> corresponds to a wireless transmitting means according to claim 8 to 11, and 3d of antenna change sections supports the antenna change means according to claim 8.

[Effect of the Invention] As explained above, according to the radio communication equipment according to claim 1 to 7 concerning this invention Since the radio and super-short distance radio of the short distance using the antenna for radio – middle distance were made switchable to the method of arbitration with the communication-mode change means Since radio was started after being able to perform proper use of the communication mode according to a communication link application, and reduction of power consumption being possible and acquiring the information for a communication link required for radio by super-short distance communication link While reducing information transmission to unrelated equipment,

the time amount compaction to communication link initiation is attained.

[0071] According to the radio communication equipment according to claim 8 to 11, moreover, with an antenna change means Since the communication mode made the class of antenna switchable as it is at either of the antenna for super-short distance radio, and the antenna for short-distance radio according to the existence of contact of a contact terminal Since radio was started after acquiring the information for a communication link required for radio by super-short distance communication link Since the time amount compaction to communication link initiation was attained, and it was made to output from an antenna further, without amplifying a signal while reducing information transmission to unrelated equipment when it was super-short distance radio, it is useful to reduction of power consumption.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the equipment which transmits and receives a data signal by wireless, especially, specifies a communications partner simply and relates to a suitable radio communication equipment to bring forward the time amount to communication link initiation.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] I had the information on the device required [when not knowing the device ID of the partner who wants to connect] of the conventional radio in order to perform radio, such as Device ID, to all the devices that exist within limits which a wireless electric wave reaches transmitted, those information was received, and the approach which a user chooses a communications partner from the inside, and connects was used.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to the radio communication equipment according to claim 1 to 7 concerning this invention Since the radio and super-short distance radio of the short distance using the antenna for radio – middle distance were made switchable to the method of arbitration with the

class of antenna switchable as it is at either of the antenna for super-short distance Since the time amount compaction to communication link initiation was attained, and radio, and the antenna for short-distance radio according to the existence of contact moreover, with an antenna change means Since the communication mode made the [0071] According to the radio communication equipment according to claim 8 to 11, communication link While reducing information transmission to unrelated equipment, reducing information transmission to unrelated equipment when it was super-short perform proper use of the communication mode according to a communication link of a contact terminal Since radio was started after acquiring the information for a communication link required for radio by super-short distance communication link application, and reduction of power consumption being possible and acquiring the communication-mode change means Since radio was started after being able to it was made to output from an antenna further, without amplifying a signal while information for a communication link required for radio by super-short distance he time amount compaction to communication link initiation is attained. distance radio, it is useful to reduction of power consumption.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, by the above-mentioned conventional approach, when there are many devices for a communication link on the outskirts, while it is necessary to choose the target communications partner and selection of a device becomes a troublesome activity out of many received devices ID,

in order to do the activity which chooses reception and a communications partner from all the devices of communication link within the limits for information, there is a problem that time amount is light by communication link initiation.

[0004] Then, this invention is made paying attention to the unsolved technical problem which such a Prior art has, and it aims at offering a suitable radio communication equipment shortening time amount until a communication link is established, and the program for radio equipment control while it is suitable to specify a communications partner simply.

[Translation done.]

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the radio communication equipment according to claim 1 concerning this invention is characterized by having a switchable communication-mode change means for a super-short distance radio means to perform radio of a super-short distance, a short-distance radio means and the radio by said short-distance radio means and the radio by said short-distance radio means. [0006] With such a configuration, it is possible to communicate the data signal in a super-short distance with a super-short distance radio means. It is possible to communicate the data signal in a short distance with a short-distance radio means. Further with a communication-mode change means Since it is possible to change to the communication link by super-short distance means of communications or the radio by short-distance means of communication of power

consumption, compaction of the time amount to data communication initiation, etc. by using the communication mode according to a communication link application properly. [0007] Here, suppose that a super-short distance is the distance from a contact location to several cm, and a short distance is the distance from the maximum distance of a super-short distance to several m. Moreover, a radio communication equipment according to claim 2 is characterized by having a switchable communication-mode change means for a super-short distance radio means to perform radio of a super-short distance, a middle distance radio means to perform middle-distance radio, and the radio by said super-short distance radio means and the radio by said middle distance radio means.

[0008] That is, it is possible to communicate the data signal in a super-short distance with a super-short distance radio means. It is possible to communicate a middle-distance data signal with a middle distance radio means. Further with a communication-mode change means Since it is possible to change to the communication-mode change means Since it is possible to change to the communication link by super-short distance means of communications or the radio by middle distance means of communications, it is useful to reduction of power consumption, compaction of the time amount to data communication initiation, etc. by using the communication mode according to a communication link application properly. [0009] Here, suppose that middle distance is the distance from the maximum distance of a short distance to dozens of meters. Moreover, it is characterized by communicating radio information required in order that invention concerning claim 3 may perform radio other than a communications partner and said super-short distance radio means.

[0010] That is, it is characterized by communicating radio information required in order for a communications partner and said radio means to perform radio by said contact process means of communications. That is, it was made to communicate with a super—short distance radio means about radio information required in order to perform radio [say / receiving the proper ID for identifying a communications partner required in order to perform radio etc, from a communications partner required in order to perform radio etc, from a communications partner conversely]. Therefore, since it becomes the communication link of a super—short distance, while preventing transmitting the password and identification information of equipment to unrelated equipment, it is useful to becoming possible to start radio easily and shortening the time amount to communication link initiation using the acquired radio information.

[0011] Moreover, the radio communication equipment according to claim 4 is characterized by having a switchable communication-mode change means for the antenna for radio, a radio means to perform radio of a data signal using the antenna for radio concerned, a contact terminal, the contact process means of communications that communicates said data signal through the contact terminal concerned, and the radio by said radio means and the communication link by said contact process means of communications.

[0012] Since with such a configuration it is possible to perform radio using the antenna for radio with a radio means, it is possible to perform the communication link which minded the contact terminal by contact process means of communications and it is still more possible to change the radio by the radio means or the communication link by contact process means of communications with a communication—mode change means, proper use of the communication mode according to a communication link application can be performed, and it is convenient. Moreover, it is characterized by communicating radio information required in order that invention concerning claim 5 may perform radio with a communications partner and said radio means in a radio communication equipment according to claim 4 by said contact process means of communications.

perform radio etc. from a communications partner, or notifying the discernment ID of a performs radio of said data signal by electromagnetic induction, and the radio by said receiving the proper ID for identifying a communications partner required in order to equipment, it is useful to becoming possible to start radio easily and shortening the transmitting the password and identification information of equipment to unrelated adio means and the radio by said electromagnetic means of communications using communications about radio information required in order to perform radio ${\mathbb L}$ say ${\mathcal L}$ time amount to communication link initiation using the acquired radio information. self-equipment proper etc. to a communications partner conversely J. Therefore, since it becomes the communication link of 1 to 1 by contact, while preventing characterized by having a switchable communication-mode change means for a he antenna for radio, a radio means to perform radio of a data signal using the communications partner, the electromagnetic means of communications which [0014] Moreover, the radio communication equipment according to claim 6 is [0013] That is, it was made to communicate by contact process means of antenna for radio concerned, a coil, and the coil concerned.

[0015] That is, electromagnetic means of communications is made to perform radio by the electromagnetic induction using a coil. Since this method can be communicated by

little power consumption, it is using properly with the radio by the antenna for radio by the application, and it becomes possible to reduce power consumption. Moreover, it is characterized by communicating radio information required in order that invention concerning claim 7 may perform radio with said communications partner and said radio means in a radio communication equipment according to claim 6 by said electromagnetic means of communications.

[0016] That is, it was made to communicate by electromagnetic means of communications about the radio information that receive the proper ID for identifying a communications partner required in order for a radio means to perform radio etc. from a communications partner, or the discernment ID of a self-equipment proper etc. is conversely notified to a communications partner. Therefore, it is useful to becoming possible to start radio easily and bringing forward the time amount to initiation of radio using the acquired radio information, while it reduces transmitting the password and identification information of equipment to another unrelated equipment, since the radio by electromagnetic induction turns into a communication link of a short distance

[0017] Moreover, the radio communication equipment according to claim 8 concerning this invention The antenna for short-distance radio, the antenna for super-short distance radio, and a contact terminal, When the contact terminal of other equipments contacts a radio means to perform radio using either among said antenna for short-distance radio, and said antenna for super-short distance radio, and said contact terminal of self-equipment It is characterized by having the antenna change means which changes automatically the antenna which said radio means uses to said antenna for super-short distance radio.

[0018] The short-distance radio which used the antenna for short-distance radio with the radio means when it was such a configuration, When it is possible to perform super-short distance radio using the antenna for super-short distance radio and the contact terminal of other equipments contacts the contact terminal of self-equipment further Since the antenna which a radio means uses is automatically changed to the antenna for super-short distance radio with an antenna change means if the equipment is equipped with the same contact terminal when performing radio among other radio communication equipments which exist close at hand, super-short distance radio can be performed only by contacting the contact terminals, and it is convenient.

[0019] Moreover, invention concerning claim 9 is characterized by equipping said radio means with the signal amplifier which amplifies the data signal outputted from said

antenna in the radio communication equipment according to claim 8. That is, a radio means amplifies the data signal outputted from an antenna by the signal amplifier. Moreover, invention concerning claim 10 is characterized by said radio means amplifying said data signal by said signal amplifier only in the radio which used said antenna for short-distance radio in the radio communication equipment according to claim 9.

[0020] That is, in the radio using the antenna for super-short distance radio of a super-short distance, a radio means is outputted from an antenna, without amplifying the data signal by the signal amplifier, and is useful to holding down consumption of useless power. Moreover, it is characterized by performing the communication link of radio information required in order that invention concerning claim 11 may perform radio with a communications partner and said radio means in a radio communication equipment according to claim 8 to 10 by the radio using said antenna for short-distance radio.

0022] Moreover, the radio communications system according to claim 12 concerning perform a communications partner and radio, and is characterized by performing said he radio of a super-short distance. That is, it is the system which performs radio with: concerning this invention The super-short distance radio step which is a program for to perform the communication link of the radio information that receive the proper ID short-distance radio easily, and bringing forward the time amount to the improvement communications partner and radio using the acquired radio information concerned by .0021] That is, the radio using the antenna for super-short distance radio was made while reducing transmitting the password and identification information of equipment his invention is equipped with a radio communication equipment according to claim 1 the said equipments using a radio communication equipment according to claim 1 to Therefore, since it becomes the communication link of a short distance extremely, adio device control for controlling the radio processing in a radio communication equipment according to claim 1, and performs radio processing of a super-short to 11 two or more, communicates the information for radio required in order to or identifying a communications partner required in order for a radio means to self-equipment proper etc. is conversely notified to a communications partner. perform radio etc. from a communications partner, or the discernment ID of a [0023] Moreover, the program for radio device control according to claim 13 11, and since the operation effectiveness overlaps, it omits a publication. to another unrelated equipment, it is useful to becoming possible to start in security, and initiation of radio using the acquired radio information.

which performs change processing with the super-short distance radio processing by said super-short distance radio step, and the middle distance radio processing by said which performs change processing with the super-short distance radio processing by said super-short distance radio step, and the short-distance radio processing by said concerning this invention The super-short distance radio step which is a program for other than a communications partner and said super-short distance in the program for step. Moreover, the program for radio device control according to claim 16 concerning distance with said super-short distance radio means, The middle distance radio step charactenized by having the communications processing change step which performs processing in a radio communication equipment according to claim 4. The radio step distance with said super-short distance radio means, The short-distance radio step information required in order that invention concerning claim 15 may perform radio radio device control according to claim 13 or 14 in said super-short distance radio which performs radio processing of a short distance with said short-distance radio [0025] Moreover, it is characterized by performing the communication link of radio which performs radio processing of a data signal performed using said antenna for communications processing by said contact process communication link step with radio device control for controlling the radio processing in a radio communication means, It is characterized by having the communications processing change step means, it is characterized by having the communications processing change step which performs middle-distance radio processing with said middle distance radio equipment according to claim 2, and performs radio processing of a super-short performs the communications processing of said data signal performed by said radio by said radio means, The contact process communication link step which contact process means of communications through said contact terminal, It is this invention It is a program for radio device control for controlling the radio [0024] Moreover, the program for radio device control according to claim 14 middle distance radio step with said communication-mode change means. short-distance radio step with said communication-mode change means. change processing with the radio processing by said radio step, and the said communication-mode change means.

[0026] Moreover, invention concerning claim 17 is characterized by performing the communications processing of radio information required for the radio processing performed in a communications partner and said radio step in said contact process communication link step in the program for radio device control according to claim 16. Moreover, the program for radio device control according to claim 16.

invention It is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 6. The radio step which performs radio processing of a data signal performed using said antenna for radio by said radio means. The electromagnetic communication link step which performs radio processing of said data signal performed by the electromagnetic induction using a coil by said electromagnetic means of communications. It is characterized by having the communications processing change step which performs change processing with the radio processing by said radio step, and the radio processing by said electromagnetic communication link step with said communication—mode change means.

[0027] Moreover, invention concerning claim 19 is characterized by performing the communications processing of radio information required for the radio processing performed in said communications partner and said radio step in said electromagnetic communication link step in the program for radio device control according to claim 18. Moreover, the program for radio device control according to claim 20 concerning this invention It is a program for radio device control for controlling the radio processing in a radio communication equipment according to claim 6. The radio step which performs radio processing performed by said radio means using either among said antenna for short-distance radio, and said antenna for super-short distance radio, The radio processing change step which changes automatically the radio processing performed in said radio step to super-short distance radio was used when the contact terminal of other equipments contacts said contact terminal of self-equipment, It is characterized by preparation

[0028] Moreover, invention concerning claim 21 is characterized by performing signal magnification processing which amplifies the data signal outputted from said antenna by said signal amplifier in said radio step in the program for radio device control according to claim 20. Moreover, it is characterized by invention concerning claim 22 performing said signal magnification processing only in the radio using said antenna for short—distance radio in said radio step in the program for radio control according to claim 21.

[0029] Moreover, invention concerning claim 23 is characterized by performing the communications processing of radio information required for the radio processing performed in a communications partner and said radio step in the radio step using said antenna for super—short distance radio in the program for radio device control according to claim 20 to 22. The program for radio device control according to claim 13 to 23 is a program for controlling the radio processing in a radio communication

equipment according to claim 1 to 9 here, and since the effectiveness overlaps, it omits a publication.

030

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. <u>Drawing 1</u> thru/or <u>drawing 9</u> are drawings showing the gestalt of operation of the radio communication equipment concerning this invention. First, the 1st example of a configuration of the radio communication equipment concerning this invention is explained based on <u>drawing 1</u>. <u>Drawing 1</u> is the block diagram showing the 1st example of a configuration of the radio communication equipment concerning this invention. As shown in <u>drawing 1</u>, the 1st example 1 of a configuration of a radio communication equipment 1st radio control section 1a, 1st antenna 1b for radio, and 1st short-distance Radio Communications Department 1c, it has composition equipped with 1d of terminals for a contact communication link, contact process communications department 1e, 1f of 1st communication—mode change section, 1g of 1st storage section and 1st CPU1h, 1st ROM1i, 1st RAM1i, and 1st bus 1k.

[0031] 1st radio control-section 1a controls radio processing, and performs generation of the transmission data in the transmitting processing and reception of a data signal by wireless, and transmission of a processing instruction. 1st antenna 1b for radio is an antenna for performing radio of a short distance. 1st short-distance Radio Communications Department 1c performs processing which outputs the data for transmission from 1st antenna 1for radio b to a short distance according to the instruction from 1st radio control-section 1a.

[0032] 1d of terminals for a contact communication link is for transmitting data by contact for the same terminal of other equipments. Contact process communications department 1e is for performing data transceiver processing between other communication equipment through 1d of terminals for a contact communication link, and processes a monitor, data transmission processing, etc. of a contact condition. If of 1st communication—mode change section is for carrying out control which changes the short-distance radio by 1st short-distance Radio Communications Department 1c, and the communication link by contact process communications department 1e, and performs only one processing according to the communicate mode set up by actuation of the control unit which is not illustrated.

[0033] Ig of 1st storage section is for memorizing the data transmitted and received by the communication link through radio or 1d of terminals for a contact communication link. 1st CPU1h is for performing the program for control memorized

by 1st ROM1i for controlling processing of each part of the above. 1st ROM1i has memorized the above-mentioned program for control, and also has memorized the identification information of an equipment proper etc.

[0034] 1st RAMIj is for memorizing required data, in case 1st CPU1h performs the above-mentioned program for control. 1st bus 1k is a data communication way for performing data communication between each part of the above. Next, more concrete actuation is explained based on <u>drawing 4</u>. <u>Drawing 4</u> is drawing showing signs that the communication devices of the same type are performing radio, (a) is drawing showing the situation of radio using 1d of terminals for a contact communication link by contact process communications department 1e, and (b) is drawing showing the situation of radio using the 1st antenna for radio by 1st short-distance Radio Communications Department 1c.

Department 1c reads the data to transmit from the 1st storage section based on the communication link information on the acquired communications partner and performs as shown in drawing 4 (a). In the gestalt of this operation, transmission and reception communications partner to perform short-distance radio by the super-short distance from 1st ROM1i by contact process communications department 1e, and transmission of the information for a communication link required in order to communicate with a 11a for a contact communication link of the 2nd radio communication equipment 41, modulation processing etc., as shown in drawing 4 (b), it will perform short-distance communication link of the 1st radio communication equipment 40, and 2nd terminal protocol of short-distance radio, is transmitted and received beforehand, it is read dentification information of the equipment proper memorized by 1st ROM1i and a contact process communications department 1e. Furthermore, if a communication [0036] Furthermore, as information for a communication link, information, such as communication mode will be performed by 1f of 1st communication-mode change Communications Department 1c, after 1st short-distance Radio Communications communications partner is acquired by this communication link, the change of a Communications Department 1c from the super-short distance radio method by node changes to the short-distance radio method by 1st short-distance Radio adio processing which outputs the data signal modulated from the antenna of communication link is performed by contacting 1st terminal 40a for a contact radio by this terminal for a contact communication link will be performed. processing is performed. And if the communication link information on a section in the short-distance radio method by 1st short-distance Radio [0035] First, the communication link using 1d of terminals for a contact

[0037] Furthermore, the flow of actuation of the control program in the 1st example 1 $\overline{1}$. Drawing $\overline{1}$ is a flow chart which shows processing of the program for control in the st example 1 of a configuration of a radio communication equipment of operation. As terminals for a contact communication link judged and contacted [whether the same of a configuration of a radio communication equipment is explained based on <u>drawing</u> contacted, and] (Yes), it shifts to step S708, and when that is not right, (No) stands communication-mode change section, and it shifts to step S704 by it so that it may shown in drawing 7, it shifts to step S700 first, and by the control unit which is not communications processing by contact process communications department 1e will illustrated, it is set as the super-short distance radio mode in which the contact ROMI's memorizing and performing the program for *** control by 1st CPU1h. be started, and it will shift to step S706. At step S706, when it judges that 1d of terminal for a contact communication link of other communication devices was become the communication mode for which the communication mode used the terminal for a communication link according a communication mode to contact self-equipment. In addition, processing of these each part is performed by 1st process communications department 1e was used, and shifts to step S702. contact terminal for a communication link. If it shifts to step S704, the [0038] At step S702, change processing is performed by 1f of 1st by until it contacts.

whether the information for a communication link from a communications partner was short-distance radio mode, and shifts to step S712. At step S712, change processing self-equipment to a communications partner, and after both are in the condition with acquired, and when judged with having acquired communication link information (Yes) contacts and acquires the information for a communication link. In the gestalt of this is performed by 1f of 1st communication-mode change section, and it shifts to step method by 1st short-distance Radio Communications Department 1c. At step S714, operation here, the information for a communication link also transmits the thing of it shifts to step S710, and when that is not right, (No) continues processing until it [0040] When it shifts to step S710, a communication mode is automatically set as processing of communication link information is performed, and further, it judges short-distance Radio Communications Department 1c. Here, 1st short-distance S714 by it so that a communication mode may turn into a short-distance radio the short-distance radio which used the 1st antenna for radio is started by 1st the mutual information for a communication link, it shifts to the following step. [0039] Since contact was checked when it shifted to step S708, transceiver

Radio Communications Department 1c reads the data to transmit from 1g of 1st storage section, and short-distance radio performs modulation processing to which the data signal is compounded with a subcarrier, and is performed with changing into the data for transmission and outputting from 1st antenna 1for radio b.

[0041] Furthermore, the 2nd example of a configuration of the radio communication equipment concerning this invention is explained based on <u>drawing 2</u>. <u>Drawing 2</u> is the block diagram showing the 2nd example of a configuration of the radio communication equipment concerning this invention. As shown in <u>drawing 2</u>, the 2nd example 2 of a configuration of a radio communication equipment With 2nd radio control section 2a, the 2nd antenna 2 for radio, and the 2nd short distance Radio Communications Department 2 It has composition equipped with coil 2d for radio, electromagnetic Radio Communications Department 2e, 2f of 2nd communication—mode change section, 2g of 2nd storage section and 2nd CPU2h, 2nd ROM2i, 2nd RAM2i, and 2nd bus 2k

[0042] 2nd radio control-section 2a controls radio processing, and performs generation of the transmission data in the transmitting processing and reception of a data signal by wireless, and transmission of a processing instruction. 2nd antenna 2b for radio is an antenna for performing radio of a short distance. 2nd short-distance Radio Communications Department 2c performs processing which outputs the data for transmission from 2nd antenna 2b for radio to a short distance according to the instruction from 2nd radio control-section 2a.

[0043] Coil 2d for radio is for causing electromagnetic induction and carrying out the radio transmission of the data by approach with the same coil. Electromagnetic Radio Communications Department 2e performs processing for transmitting data to other communication equipment using the electromagnetic induction by coil 2d for radio, and performs processing for transmitting and receiving data by electromagnetic induction. 2f of 2nd communication—mode change section is for carrying out control which changes the short-distance radio by 2nd short-distance Radio Communications Department 2c, and the super-short distance radio by electromagnetic Radio Communications Department 2e, and is made to perform only one processing according to the communicate mode set up by actuation of the control unit which is

[0044] 2g of 2nd storage section is for memorizing the data transmitted and received by the super-short distance radio which used short-distance radio and coil 2d for radio which used 2nd antenna 2b for radio. 2nd CPU2h is for performing the program for control memorized by 2nd ROM2i for controling processing of each part of the

above. 2nd ROM2i has memorized the above-mentioned program for control, and also has memorized the identification information of an equipment proper.

[0045] 2nd RAM2j is for memorizing required data, in case 1st CPU2h performs the above—mentioned program for control. 2nd bus 2k is a data communication way for performing data communication between each part of the above. Next, more concrete actuation is explained based on <u>drawing 5</u>. <u>Drawing 5</u> is drawing showing signs that radio by the communication devices of the same type is performed, (a) is drawing showing the communicative situation using coil 2d for radio by electromagnetic communications department 2e, and (b) is drawing showing the situation of radio using 2nd antenna 2b for radio by 2nd short-distance Radio Communications Department

[0046] First, the communication link using coil 2d for radio is performed by bringing 1st output section 50a of the 3rd radio communication equipment 50, and 2nd output section 51a of the 4th radio communication equipment 51 close to the distance which can communicate, as shown in <u>drawing 5</u> (a). In the gestalt of this operation, transmission and reception of communication link information required in order to perform a target communications partner and short-distance radio will be performed by the radio using electromagnetic induction with this coil for radio. In order to perform a radio transmission, modulation processing etc. is performed, and the data of the information for a communication link which information, such as identification information of the equipment proper memorized by 2nd ROM2i and a communicative protocol, was beforehand transmitted as communication link information, and was read from 2nd ROM2i by electromagnetic Radio Communications Department 2e are transmitted to a phase hand through coil 2d for radio.

[0047] And if the communication link information on a communications partner is acquired by the super-short distance radio by electromagnetic Radio Communications Department 2e, the change of a communication mode will be performed by 2f of 2nd communication-mode change section in the short-distance radio method by 1st short-distance Radio Communications Department 2c from the super-short distance radio method by electromagnetic Radio Communications Department 2c from the super-short distance if a communication mode changes to the short-distance radio method by 2nd short-distance Radio Communications Department 2c, after 2nd short-distance Radio Communications Department 2c reads the data to transmit from 2g of 2nd storage section based on the communication link information on the communications partner acquired by super-short distance radio and performs modulation processing etc., as shown in drawing 5 (b), it will perform the short-distance radio processing which

outputs the data signal modulated from the antenna of self-equipment. In addition, processing of these each part is performed by 2nd ROM2's memorizing and performing the program for **** control by 2nd CPU2h.

[0048] Furthermore, the flow of actuation of the control program in the 2nd example 2 of a configuration of a radio communication equipment is explained based on <u>drawing</u> 8. <u>Drawing</u> 8 is a flow chart which shows processing of the program for control in the 2nd example 2 of a configuration of a radio communication equipment of operation. As shown in <u>drawing</u> 8, it shifts to step S800 first, and by the control unit which is not illustrated, it is set as the super-short distance radio mode in which coil 2d for radio according a communication mode to electromagnetic Radio Communications
Department 2e was used, and shifts to step S802.

Department ze was used, and sinits to step 300z. [0049] At step S802, change processing is performed by 2f of 2nd

communication-mode change section, and it shifts to step S804 by it so that it may become the super-short distance radio method with which the communication mode used coil 2d for radio. If it shifts to step S804, the super-short distance radio processing by electromagnetic Radio Communications Department 2e will be started, and it will shift to step S806. At step S806, when judged with coil 2d for radio having judged whether it moved within limits which can radiocommunicate by electromagnetic induction with the same coil for radio of other communication devices, and having moved (Yes), it shifts to step S808, and when that is not right, (No) stands by until it moves to within the limits.

[0050] Since the migration to within the limits was checked when it shifted to step S808, transceiver processing of the information for a communication link is performed, and further, it judges whether the information for a communication link from a communications partner was acquired, and processing is continued until it shifts to step S810 when judged with having acquired communication link information (Yes). (No) moves to within the limits when that is not right, and it acquires the information for a communication link. In the gestalt of this operation here, the information for a communication link also transmits the thing of self-equipment to a communications partner, and after both are in the condition with the mutual information for a communication link, it shifts to the following step.

[0051] When it shifts to step S810, a communication mode is automatically set as short-distance radio mode, and shifts to step S812. At step S812, change processing is performed by 2f of 2nd communication-mode change section, and it shifts to step S814 by it so that a communication mode may turn into a short-distance radio method by 2nd short-distance Radio Communications Department 2c. At step S814,

the short-distance radio which used 2nd antenna 2b for radio is started by 2nd short-distance Radio Communications Department 2c. Here, 2nd short-distance Radio Communications Department 2c reads the data to transmit from 2g of 2nd storage section, and short-distance radio performs modulation processing to which the data signal is compounded with a subcarrier, and is performed with changing into the data for transmission and outputting from 2nd antenna 2b for radio.

[0052] Furthermore, the 3rd example of a configuration of the radio communication equipment concerning this invention is explained based on <u>drawing 3</u>. <u>Drawing 3</u> is the block diagram showing the 3rd example of a configuration of the radio communication equipment concerning this invention. As shown in <u>drawing 3</u>, the 3rd example 3 of a configuration of a radio communication equipment. The 3rd radio control-section 3a, Radio Communications Department 3b, and antenna 3c for super-short distance radio, it has composition equipped with antenna 3d for short-distance radio, antenna change section 3e, 3f of signal amplifiers, 3g of 3rd storage section and 3rd CPU3h, 3rd ROM3i, 3rd RAM3j, and 3rd bus 3k.

[0053] 3rd radio control-section 3a controls the communications processing of the data based on wireless, and performs control of transmitting processing or reception, generation of the data for a communication link, etc. Radio Communications
Department 3b performs radio using antenna 3for super-short distance radio c, or antenna 3d for short-distance radio, and processes based on the control instruction from 3rd radio control-section 3a. Antenna 3c for super-short distance radio is an antenna for performing the communications partner and super-short distance radio which are performed when the contact terminal of other equipments contacts the contact terminal of the self-equipment which is not illustrated.

[0054] Antenna 3d for short-distance radio is an antenna for performing the communications partner and the short-distance radio of the purpose. Antenna change section 3e changes an antenna to antenna 3c for super-short distance radio automatically, when the contact terminal of other equipments contacts the contact terminal of self-equipment, and when performing radio of a short distance, it performs processing automatically changed with the antenna for short-distance radio. Here, according to the existence of contact of a contact terminal, and the acquisition situation of communication link information, an antenna is changed automatically. [0055] 3f of signal amplifiers is for amplifying the signal outputted from antenna 3d for short-distance radio. When performing super-short distance radio which used antenna 3c for super-short distance radio in the gestalt of this operation here, it outputs from an antenna, without amplifying a signal. 3g of 3rd storage section is for

memorizing the data transmitted and received by super-short distance radio and short-distance radio.

[0056] 3rd CPU3h is for performing the program for control memorized by 3rd ROM3i for controlling processing of each part of the above. 3rd ROM3i has memorized the above-mentioned program for control, and also has memorized the identification information of an equipment proper, and information for a communication link, such as a password. 3rd RAM3j is for memorizing required data, in case 3rd CPU3h performs the above-mentioned program for control.

[0057] 3rd bus 3k is a data communication way for performing data communication between each part of the above. Next, more concrete actuation is explained based on drawing 6. Drawing 6 is drawing showing signs that radio by the communication devices of the same type which have a contact terminal is performed. (a) is drawing showing the situation using antenna 3c for super-short distance radio of super-short distance radio, and (b) is drawing showing the situation using antenna 3d for short-distance radio.

[0058] First, radio mode is set up by actuation of the control unit which is not illustrated. 3rd radio control-section 3a transmits mode information to antenna change section 3e according to this mode setting. Here, when the contact terminal of self-equipment touches the contact terminal of other equipments, processing which chooses antenna 3c for super-short distance radio by antenna change section 3e is performed. If Radio Communications Department 3b is the radio of a super-short distance in the gestalt of this operation, transmitting processing of the data for transmission (here information for a communication link) will be performed without minding 3f of signal amplifiers.

[0059] On the other hand, the contact terminal of self-equipment contacts the contact terminal of other equipments, and does not shine, and when communication link information is acquisition ending, antenna change section 3e chooses antenna 3d for short-distance radio, and Radio Communications Department 3b makes the data signal for transmission amplify in 3f of signal amplifiers, and outputs the data signal for transmission from antenna 3d for short-distance radio. That is, the communication link using antenna 3c for super-short distance radio is performed by contacting 3rd terminal 60a for a contact communication link of the 5th radio communication equipment 60, and 4th terminal 61a for a contact communication link of the 6th radio communication equipment 61, as shown in <u>drawing 6</u> (a). In the gestalt of this operation, transmission and reception of the information for a communication link required in order for this super-short distance radio to perform a target

communications partner and short-distance radio will be performed. As information for a communication link, the information on the identification information of the equipment proper memorized by 3rd ROM2i, the password for obtaining communication link authorization, etc. is transmitted beforehand. By 3rd radio control-section 3a In order to perform a radio transmission, modulation processing etc. is performed, and the data of the information for a communication link read from 3rd ROM3i are outputted by Radio Communications Department 3b from antenna 3for super-short distance radio c.

[0060] And when acquiring the information for a communication link and performing a communications partner and short-distance radio As antenna 3d for short-distance radio is chosen by antenna change section 3e and it is shown in <u>drawing 6</u> (b) The 5th radio communication equipment 60 and 6th radio communication equipment 61 are in the condition of having separated mutually within the limits of the short distance, and short-distance radio is performed with outputting the signal amplified by Radio Communications Department 3b from antenna 3d for short-distance radio through 3f of signal amplifiers.

[0061] Furthermore, the flow of actuation of the control program in the 3rd example 3 of a configuration of a radio communication equipment is explained based on drawing 10. <u>Drawing 9</u> is a flow chart which shows processing of the program for control in the 3rd example 3 of a configuration of a radio communication equipment of operation. As shown in <u>drawing 9</u>, when it shifts to step S900 first, it judges whether there was any contact of contact terminals and there is contact (Yes), it shifts to step S902, and when that is not right, (No) shifts to step S908.

[0062] When it shifts to step S902, antenna 3c for super-short distance radio is chosen by antenna change section 3e, and it shifts to step S904 by it. If it shifts to step S904, by Radio Communications Department 3b, super-short distance radio using antenna 3c for super-short distance radio will be performed, and it will shift to step S906. At step S906, when judged with having judged whether radio was completed or not and having ended (Yes), communications processing is ended, and when that is not right, (No) shifts to step S900.

[0063] When judged with on the other hand judging and acquiring whether the information for a communication link is acquired when there is no contact of a contact terminal and it shifts to step S908 at step S900 (Yes), it shifts to step S910, and when that is not right, (No) shifts to step S900. If it shifts to step S910, by antenna change section 3e, antenna 3d for short-distance radio will be chosen as an antenna which Radio Communications Department 3b uses, and it will shift to step S912.

10064] At step S912, by Radio Communications Department 3b, short-distance radio using antenna 3d for short-distance radio is performed, and it shifts to step S906. As mentioned above, since it becomes possible to reduce that those information is received by unrelated equipment since according to the gestalt of the above-mentioned implementation the radio of a super-short distance is made to be reform the discernment data of a communication device proper, and transmission and reception of a password in case radio is performed, it is useful to improvement in

[0065] Moreover, since the information for a communication link is quickly [simply and] acquirable in the 1st example 1 of a configuration which acquired the information for a communication link by the super-short distance communication link by 1d of terminals for a contact communication link, it is possible to shorten the time amount to radio initiation. Moreover, since the information for a communication link is simply acquirable in the 2nd example 2 of a configuration which acquired the information for a communication link by the super-short distance communication link by coil 2d for radio, it is possible to shorten the time amount to radio initiation.

[0066] Moreover, since it communicates by changing to the antenna for super-short distance radio automatically when there is contact of a contact terminal in the 3rd example 3 of a configuration which changed the class of antenna used for a communication link according to the existence of contact of a contact terminal, the information for a communication link can be acquired simply and quickly, the time amount to radio initiation can be shortened, and it is convenient. Moreover, in the 3rd example 3 of a configuration, since he is trying to output from an antenna at the time of the super-short distance radio using the antenna for super-short distance radio, without amplifying a signal, it becomes reduction of power consumption.

[0067] The short-distance radio processing by 1st radio control section 1a and 1st short-distance Radio Communications Department 1c which are shown in drawing 1 here It corresponds to a short-distance radio means according to claim 1 and a radio

[0067] The short-distance radio processing by 1st radio control section 1a and 1st short-distance Radio Communications Department 1c which are shown in <u>drawing 1</u> here It corresponds to a short-distance radio means according to claim 4. 1st antenna 1b for radio It corresponds to the antenna for radio according to claim 4. 1st antenna 1b for radio It corresponds to the antenna for radio according to claim 4. 1d of terminals for a contact communication link It corresponds to a contact terminal according to claim 4, contact process communications department 1e corresponds to claim 4 and contact process means of communications according to claim 5, and 1f of 1st communication-mode change section supports claims 1 and 4 and the communication-mode change means of five publications.

[0068] Furthermore, the short-distance radio processing by 2nd radio control section

2a and 2nd short-distance Radio Communications Department 2c which are shown in drawing 2 It corresponds to a short-distance radio means according to claim 1 and claim 6, and the radio means of seven publications. 2nd antenna 2b for radio It corresponds to the antenna for radio according to claim 6. Coil 2d for radio It corresponds to a coil according to claim 6, electromagnetic Radio Communications Department 2e corresponds to claim 6 and electromagnetic means of communications according to claim 7, and 2f of 2nd communication-mode change section corresponds to claims 1 and 4 and the communication-mode change means of six publications. [0069] Furthermore, the radio by the 3rd radio control-section 3a and Radio Communications Department 3b which are shown in drawing 3 corresponds to a wireless transmitting means according to claim 8 to 11, and 3d of antenna change sections supports the antenna change means according to claim 8.

[Translation done.]

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2.*** shows the word which can not be translated.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the 1st example of a configuration of the radio communication equipment concerning this invention.

[<u>Drawing 2]</u> It is the block diagram showing the 2nd example of a configuration of the radio communication equipment concerning this invention.

[Drawing 3] It is the block diagram showing the 3rd example of a configuration of the radio communication equipment concerning this invention.

Drawing 4] It is drawing showing signs that the communication devices of the same

type are performing radio, and (a) is drawing showing the situation of radio using 1d of terminals for a contact communication link by contact process communications department 1e, and (b) is drawing showing the situation of radio using the 1st antenna for radio by 1st short-distance Radio Communications Department 1c.

<u>[Drawing 5]</u> It is drawing showing signs that radio by the communication devices of the same type is performed, and (a) is drawing showing the communicative situation using coil 2d for radio by electromagnetic communications department 2e, and (b) is drawing showing the situation of radio using 2nd antenna 2b for radio by 2nd short-distance Radio Communications Department 2c.

[Drawing 6] It is drawing showing signs that radio by the communication devices of the same type is performed, and (a) is drawing showing the situation of the radio by super-short distance radio, and (b) is drawing showing the situation of the radio by short-distance radio or middle distance radio.

[Drawing 7] It is the flow chart which shows processing of the program for control in the 1st example 1 of a configuration of a radio communication equipment of operation. [Drawing 8] It is the flow chart which shows processing of the program for control in the 2nd example 2 of a configuration of a radio communication equipment of operation. [Drawing 9] It is the flow chart which shows processing of the program for control in the 3rd example 3 of a configuration of a radio communication equipment of operation. [Description of Notations]

1 1st Example of Configuration of Radio Communication Equipment

1a The 1st radio control section

1b The 1st antenna for radio

1c The 1st short-distance Radio Communications Department

1d Terminal for a contact communication link

1e Contact process communications department

If The 1st communication-mode change section

2 2nd Example of Configuration of Radio Communication Equipment

2a The 2nd radio control section

2b The 2nd antenna for radio

2c The 2nd short-distance Radio Communications Department

2d Coil for radio

2e Electromagnetic Radio Communications Department

2f The 2nd communication-mode change section

3 3rd Example of Configuration of Radio Communication Equipment

3a The 3rd radio control section

- 3b Radio Communications Department
- 3c The antenna for super-short distance radio
- 3d Antenna for short-distance radio
- 3e Antenna change section
- 3f Signal amplifier
- 50 1st Radio Communication Equipment
- 50a The 1st terminal for a contact communication link
- 51 2nd Radio Communication Equipment
- 51a The 2nd terminal for a contact communication link
- 60 3rd Radio Communication Equipment
- 60a The 1st output section
- 61 4th Radio Communication Equipment
- 61a The 2nd output section
- 70 5th Radio Communication Equipment
- 71 6th Radio Communication Equipment

[Translation done.]

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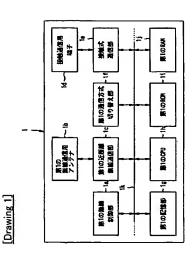
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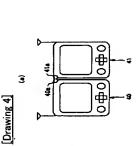
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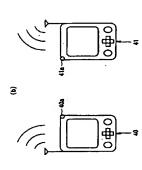
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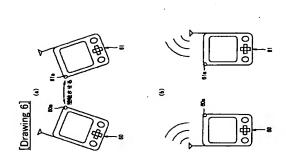
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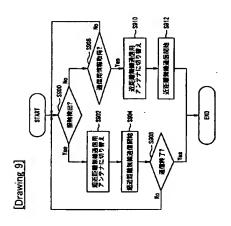
DRAWINGS

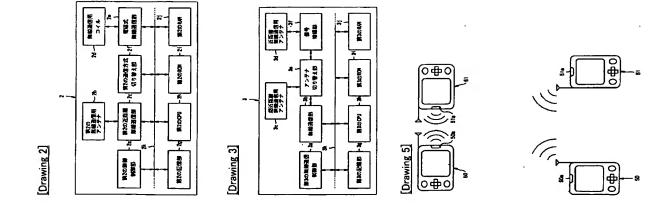




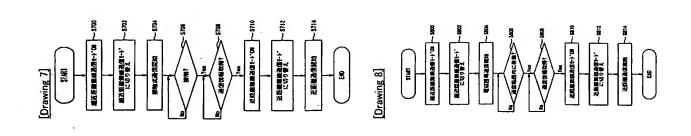








[Translation done.]



(19) 日本国物館庁 (JP)

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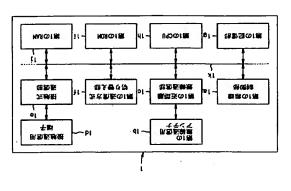
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無線通信装置及び無線通信装置倒割用プログラム (34) (発) (34)

共に、通信が確立するまでの時間を短縮するのに好適な 【課題】 通信相手を簡易に特定するのに好適であると 無線通信装置を提供する。

1 「と、第1の記憶部1gと、第1のCPU1hと、第 dと、接触式通信部1eと、第1の通信方式切り替え部 1のROM11と、第1のRAM1jと、第1のバス1 と、第1の近距離無線通信部1cと、接触通信用端子1 【解決手段】 無線通信装置の第1の構成例1を、第1 の無観制御部1aと、第1の無観通信用アンテナ1b kと、を備えた構成とした。



【特許請求の範囲】

通信手段と、近距離の無粮通信を行う近距離無線通信手 面信方式切り替え手段と、を備えることを特徴とする無 翌と、前配超近距離無線通信手段による無線通信と前配 (請求項1) 超近距離の無線通信を行う超近距離無線 近距離無線通信手段による無線通信とを切り替え可能な

原通信装置。

段と、前記超近距離無線通信手段による無線通信と前記 中距離無線通信手段による無線通信とを切り替え可能な 通信方式切り替え手段と、を備えることを特徴とする無 網近距離の無線通信を行う超近距離無線 通信手段と、中距離の無線通信を行う中距離無線通信手 【請求項2】

を行うために必要な無線通信情報の通信を、前記超近距 **整無線通信手段によって行うようになっていることを特** 【請求項3】 通信相手と前記超近距離以外の無線通信 **散とする請求項1又は請求項2配載の無線通信装置。**

【精次項4】 無線通信用アンテナと、当該無線通信用 アンテナを用いてデータ信号の無線通信を行う無線通信 接触端子と、当較接触端子を介して前配データ信号の通 目を行う接触式通信手段と、

手段と、

抗配無線通信手段による無線通信と前配接触式通信手段 こよる通信とを切り替え可能な通信方式切り替え手段 と、を備えることを特徴とする無線通信装置

【請求項5】 通信相手と前配無線通信手段によって無 **後触式通信手段によって行うようになっていることを特 原通信を行うために必要な無線通信情報の通信を、前記** 強とする請求項4記載の無線通信装置。

S 【請求項6】 無線通信用アンテナと、当該無線通信用 アンテナを用いてデータ信号の無線通信を行う無線通信

手段による無粮通信とを切り替え可能な通信方式切り替 【請求項7】 ・前記通信相手と前記無線通信手段によっ 前記電磁式通信手段によって行うようになっていること と、前記無線通信手段による無線通信と前記電磁式通信 コイルと、当該コイルを用いて通信相手と前記データ信 号の無線通信を電磁誘導によって行う電磁式通信手段 て無線通信を行うために必要な無線通信情報の通信を え手段と、を備えることを特徴とする無線通信装置。 を特徴とする間求項6記載の無線通信装置。

ちいずれか一方を利用して無頼通信を行う無頼通信手段 無線通信用アンテナと、接触端子と、前記近距離無線通 信用アンテナ及び前記超近距離無線通信用アンテナのう たときに、前配無線通信手段の利用するアンテナを前配 テナ切り替え手段と、を備えることを特徴とする無線通 【請求項8】 近距離無線通信用アンテナと、超近距離 と、自装置の前記接触端子に他装置の接触端子が接触し **囮近距離無線通信用アンテナに自動的に切り替えるアン**

特開2003-188805

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【棉求項10】 前配無線通信手段は、前配近距離無線 前配無線通信手段は、前配アンテナから 出力するデータ信号を増幅する信号増幅部を備えること を特徴とする請求項8配飯の無線通信装置。 [精水項9]

増幅部によって前記データ信号を増幅するようになって 通信用アンテナを用いた無線通信においてのみ前配信号 【請求項11】 通信相手と前配無額通信手段によって いることを特徴とする請求項9配載の無線通信装置

って行うようになっていることを特徴とする間求項8乃 無線通信を行うために必要な無線通信情報の通信を、前 【精求項12】 精求項1乃至請求項11のいずれかに 己蔵の無線通信装置を2以上備え、目的の通信相手と無 配超近距離無線通信用アンテナを利用した無線通信によ **原通信を行うために必要な無線通信用情報の通信を、超** 至請求項10のいずれかに記載の無線通信装置。 9

近距離の無線通信によって行い、当骸取得した無線通信 曾報を用いて前配通信相手と無線通信を行うことを特徴 とする無線通信システム。

無線通信処理を制御するための無線通信装置制御用プロ 【請求項13】 請求項1配載の無線通信装置における グラムであって

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前配超近距離無線通信手段によって超近距離の無線通信 処理を行う超近距離無線通信ステップと、前配近距離無 無額通信ステップと、前配通信方式切り替え手段によっ て前記超近距離無線通信ステップによる超近距離無線通 冒処理と前配近距離無線通信ステップによる近距離無額 **通信処理との切り替え処理を行う通信処理切り替えステ** ップと、を備えることを特徴とする無缺通信装置制御用 **原通信手段によって近距離の無線通信処理を行う近距離**

【請求項14】 請求項2配載の無線通信装置における 無線通信処理を制御するための無線通信装置制御用プロ グラムであって、 プログラム。

信処理と前記中距離無線通信ステップによる中距離無線 ップと、を備えることを特徴とする無線通信装置制御用 前記超近距離無線通信手段によって超近距離の無線通信 処理を行う超近距離無線通信ステップと、前記中距離無 線通信手段によって中距離の無線通信処理を行う中距離 無線通信ステップと、前配通信方式切り替え手段によっ 通信処理との切り替え処理を行う通信処理切り替えステ て前記超近距離無線通信ステップによる超近距離無線通 \$

信を行うために必要な無锒通信悄報の通信を、前配超近 とを特徴とする請求項13又は請求項14記載の無線通 【請求項15】 通信相手と前記超近距離以外の無線通 距離無規通信ステップにおいて行うようになっているこ 冒装置制御用プログラム。 プログラム。

【簡求項16】 請求項4配載の無線通信装置における 無線通信処理を制御するための無線通信装置制御用プロ

グラムであって、

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海暦2003-188805

が配無線通信手段によって前配無線通信用アンテナを用 いて行われるデータ信号の無線通信処理を行う無線通信 前配接触式通信手段によって前配接触端子を介して行わ れる前紀データ信号の通信処理を行う接触式通信ステッ

ップと、を備えることを特徴とする無線通信装置制御用 前記通信方式切り替え手段によって前記無線通信ステッ れたよる無税通信処理と前記接触式通信ステップによる 通信処理との切り替え処理を行う通信処理切り替えステ 101754

【糖水項17】 通信相手と前記無線通信ステップにお いて行われる無粮通信処理に必要な無線通信情報の通信 **処理を、前記接触式通信ステップにおいて行うようにな** っていることを特徴とする情沢項16記載の無線通信装

【請求項18】 請求項6記載の無線通信装置における 無報通信処理を制御するための無線通信装置制御用プロ ソラムであって **が配無級通信手段によって前配無級通信用アンテナを用** いて行われるデータ信号の無線通信処理を行う無線通信 ステップと、

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て前記無极通信ステップによる無線通信処理と前記電磁 行う通信処理切り替えステップと、を備えることを特徴 よって行われる前配データ信号の無線通信処理を行う電 **蛍式通信ステップと、前記通信方式切り替え手段によっ** 式通信ステップによる無線通信処理との切り替え処理を 前記電磁式通信手段によってコイルを用いた電磁誘導に とする無線通信装置制御用プログラム。

【構求項19】 前起通信相手と前配無線通信ステップ において行われる無級通信処理に必要な無線通信情報の になっていることを特徴とする請求項18記載の無穀通 通信処理を、前配布磁式通信ステップにおいて行うよう 信装置制御用プログラム。

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【甜求項20】 甜求項6記載の無粮通信装置における 無線通信処理を制御するための無線通信装置制御用プロ グラムであって、

要触したときに、前記無線通信ステップにおいて行う無 と超近距離無線通信処理に自動的に切り替える無線通信 処理切り替えステップと、を備えることを特徴とする無 一方を利用して行われる無線通信処理を行う無線通信ス テップと、自装岡の前記接触端子に他装置の接触端子が **が記無叙通信手段によって前記近距離無線通信用アンテ** ナ及び前記超近距離無線通信用アンテナのうちいずれか **泉通信処理を前配超近距離無線通信用アンテナを利用し 原通信装置制御用プログラム。**

【樹求項21】 前温無粮通信ステップにおいては、前 ピアンテナから出力するデータ信号の増幅を行う信号増 **幅処理を行うようになっていることを特徴とする請求項** 2 0 記載の無線通信装置。

【甜求項22】 前記無線通信ステップにおいては、前 のみ前配信号増幅処理を行うようになっていることを特 **散とする請求項21記載の無線通信装置制御用プログラ** 記近距離無線通信用アンテナを用いた無線通信において

【請求項23】 通信相手と前配無線通信ステップにお いて行われる無線通信処理に必要な無線通信情報の通信 処理を、前記超近距離無線通信用アンテナを利用した無 **泉通信ステップにおいて行うようになっていることを特** 徴とする精求項20乃至請求項22のいずれかに記載の 無段通信装置制御用プログラム。

【発明の群細な説明】

[0001]

タ信号の送受信を行う装置に係り、特に、通信相手を簡 易に特定し、通信開始までの時間を早めるのに好適な無 [発明の属する技術分野] 本発明は、無線によってデー 原通信装置に関する。

[0000]

【従来の技術】 従来の無線通信では、 接続したい相手の 機器1Dを知らない場合、無線電波が届く範囲内にある 全ての機器に対して、機器1Dなどの無線通信を行うた めに必要なその機器の情報を送信してもらい、それらの **情報を受信して、利用者がその中から通信相手を選択し** て接続する方法が用いられていた。

に、受信した多くの機器 1 Dの中から、目的の通信相手 【発明が解決しようとする製題】しかしながら、上記従 を選ぶ必要があり、機器の選択が煩わしい作業になると 来の方法では、周辺に多数の通信対象機器がある場合 共に、通信範囲内の機器全てから情報を受け取り、且 [0003]

【0004】そこで、本発明は、このような従来の技術 つ、通信相手を選択する作業を行うため通信開始までに 時間がかかるいといった問題がある。

通信が確立するまでの時間を短縮するのに好適な無線通 信装置及び無線装置制御用プログラムを提供することを の有する未解決の課題に着目してなされたものであっ て、通信相手を簡易に特定するのに好適であると共に、 目的としている。

[0005]

無線通信手段による無線通信と前記近距離無線通信手段 による無線通信とを切り替え可能な通信方式切り替え手 【켍題を解決するための手段】上記目的を達成するため に、本発明に係る請求項1記載の無線通信装置は、超近 距離の無線通信を行う超近距離無線通信手段と、近距離 の無線通信を行う近距離無線通信手段と、前配超近距離 段と、を備えることを特徴としている。

【0006】このような構成であれば、超近距離無線通 **信手段によって超近距離におけるデータ信号の通信を行** うことが可能であり、近距離無線通信手段によって近距 難におけるデータ信号の通信を行うことが可能であり、

応じた通信方式の使い分けを行うことで、消費電力の低 된に、通信方式切り替え手段によって、超近距離通信手 段による通信か、近距駿通信手段による無線通信かのい ずれかに切り替えることが可能であるので、通信用途に 域やデータ通信開始までの時間の短縮等に役立つ。

ンチまでの距離であり、近距離とは、超近距離の最大距 行う超近距離無線通信手段と、中距離の無線通信を行う 中距離無線通信手段と、前記超近距離無線通信手段によ 【0007】ここで、超近距離とは、接触位置から数や **精永項2記載の無線通信装置は、超近距離の無線通信を** る無線通信と前配中距離無線通信手段による無線通信と を切り替え可能な通信方式切り替え手段と、を備えるこ 魅から数メートルまでの距離であることとする。また、 とを特徴とする。

中距離通信手段による無線通信かのいずれかに切り替え 【0008】つまり、超近距離無線通信手段によって超 近距離におけるデータ信号の通信を行うことが可能であ り、中距離無線通信手段によって中距離におけるデータ 信号の通信を行うことが可能であり、更に、通信方式切 ることが可能であるので、通信用途に応じた通信方式の 使い分けを行うことで、消費電力の低減やデータ通信期 り替え手段によって、超近距離通信手段による通信か 始までの時間の短縮等に役立つ。

近距離無線通信手段によって行うようになっていること 【0009】ここで、中距離とは、近距離の最大距離か 5数十メートルまでの距離であることとする。また、請 坎項3に係る発明は、 請求項1又は請求項2記載の無線 通信装置において、通信相手と前記超近距離以外の無線 通信を行うために必要な無線通信情報の通信を、前配超 を特徴としている。

で、装置のパスワードや顔別情報を関係のない装置に伝 要な無線通信情報の通信を超近距離無線通信手段によっ **報によって、無線通信の開始を容易に行うことが可能と** 【0010】つまり、通信相手と前記無線通信手段によ を、前記接触式通信手段によって行うようになっている 必要な通信相手を離別するための固有!D 等を通信相手 から受信したり、逆に自装置固有の離別!D等を通信相 手に通知したりするといった、無線通信を行うために必 送するといったことを防ぐと共に、取得した無線通信情 ことを特徴としている。つまり、無線通信を行うために て行うようにした。従って、超近距離の通信となるの って無線通信を行うために必要な無線通信情報の通信 なり通信開始までの時間を短縮するのに役立つ。

【0011】また、請求項4記載の無粮通信装置は、無 データ信号の無線通信を行う無線通信手段と、接触端子 前配接触式通信手段による通信とを切り替え可能な通信 線通信用アンテナと、当該無線通信用アンテナを用いて 当該接触端子を介して前記データ信号の通信を行う **传触式通信手段と、前紀無線通信手段による無線通信と** 方式切り替え手段と、を備えることを特徴としている。

とが可能であり、接触式通信手段によって接触端子を介 替え手段によって、無線通信手段による無線通信か、接 独式通信手段による通信のいずれかを切り替えることが 可能であるので、通信用途に応じた通信方式の使い分け ができ、便利である。また、請求項5に係る発明は、請 **秋項4記載の無線通信装置において、通信相手と前配無 原通信手段によって無線通信を行うために必要な無線通** 信情報の通信を、前記接触式通信手段によって行うよう 【0012】このような构成であれば、無線通信手段に よって、無線通信用アンテナを用いた無線通信を行うこ した通信を行うことが可能であり、更に、通信方式切り になっていることを特徴としている。

【0013】 つまり、無線通信を行うために必要な通信 たり、逆に自装置固有の裁別ID等を通信相手に通知し たりするといった、無線通信を行うために必要な無線通 た。従って、接触による1対1の通信となるので、装置 のパスワードや敵別情報を関係のない装置に伝送すると いったことを防ぐと共に、取得した無額通信情報によっ て、無線通信の開始を容易に行うことが可能となり通信 相手を撤別するための固有!D等を通信相手から受信し 信情報の通信を接触式通信手段によって行うようにし ຂ

【0014】また、請求項6配載の無線通信装置は、無 と、当該コイルを用いて通信相手と前配データ信号の無 線通信を電磁誘導によって行う電磁式通信手段と、前配 無線通信手段による無線通信と前配電磁式通信手段によ **原通信用アンテナと、当核無線通信用アンテナを用いて** データ信号の無線通信を行う無線通信手段と、コイル る無線通信とを切り替え可能な通信方式切り替え手段

開始までの時間を短縮するのに役立つ。

【0015】つまり、電磁式通信手段によって、コイル を用いた電磁誘導による無線通信を行うようにしたもの である。この方式は少ない消費電力で通信を行うことが 可能であるため用途によって無線通信用アンテナによる 無線通信と使い分けることで、消費電力を低減すること が可能となる。また、請求項7に係る発明は、請求項6 記載の無線通信装置において、前記通信相手と前配無線 通信手段によって無線通信を行うために必要な無線通信 **竹報の通信を、前記電磁式通信手段によって行うように** と、を備えることを特徴としている。 なっていることを特徴としている。

行うために必要な通信相手を識別するための固有!D等 **専を通信相手に通知したりするといった、無線通信悄賴** 【0016】つまり、無線通信手段によって無線通信を を通信相手から受信したり、逆に自装価固有の鑑別ID の通信を電磁式通信手段によって行うようにした。従っ て、電磁誘導による無線通信は、極めて近距離の通信と なるので、装置のパスワードや磔別情報を関係のない別 の装置に伝送するといったことを低減すると共に、取得 した無線通信情報によって、無線通信の開始を容易に行 **うことが可能となり、無線通信の開始までの時間を早め** S 9

海隅2003-188805

らのに得けつ。

【0017】また、本発明に係る結氷頃8配礎の無線通信装置は、近距離無線通信用アンテナと、超近距離無線通信用アンテナと、超近距離無線通信用アンテナ及が耐湿超近距離無線通信用アンテナのうちいずれか一方を利用して無線通信を行う無線通信手段と、自装置の前配接触端子に他装置の接触端子が接触したときに、前配無線通信用アンテナに自動的に切り替えるアンテナ切り替え手段と、を備えることを特徴としている。

アンテナから川力するデータ信号を増幅する信号増幅部 無線通信手段は、前記近距離無線通信用アンテナを用い た無線通信においてのみ前配信号増幅部によって前配デ よって、近距離無線通信用アンテナを利用した近距離無 距離無線通信を行うことが可能であり、更に、自装圏の 装置との間で無線通信を行うときにその装置が同様な接 勉端子を備えていれば、その接触端子同士を接触させる **載の無線通信装置において、前配無線通信手段は、前配** 信号増幅部によってアンデナより出力するデータ信 【0018】このような構成であれば、無線通信手段に **線通信と、超近距離無線通信用アンテナを利用した超近** 接触端子に、他装置の接触端子が接触したときには、ア ンテナ切り替え手段によって、無線通信手段の利用する アンテナを超近距離無線通信用アンテナに自動的に切り 替えるようになっているので、間近にある他の無線通信 【0019】また、精永項9に係る発明は、請求項8記 を備えることを特徴としている。つまり、無線通信手段 号を増幅するようになっている。また、精泉項10に係 **一夕信号を増幅するようになっていることを特徴として** だけで超近距離無線通信を行うことができ便利である。

【0020】つまり、無線通信手段は、超近距離無線通信用アンテナを利用した超近距離の無線通信において、 信号暗幅部によるデータ信号の控幅をせずにアンテナから出力するようになっているもので、無駄な電力の消費を抑えるのに役立つ。また、請求項11に係る発明は、請求項8乃至請求項10のいずれかに記載の無線通信装置において、通信相手と前記無減通信予段によって無線通信を行うために必要な無線通信情報の通信を、前記近距離振過通用下分子すを利用した無級通信性の適信と、前記近距離無過通用限の通信と、前記近距離無過通用限の通信と、前記近距離無過通用限の通信と、可に対した無級通信性と可に対して無級通信性を可に表して行うようになっていることを特徴としている。

(0021)つまり、無線通信手段によって無線通信を行うために必要な通信相手を翻別するための固有 1 D等を通信相手から受信したり、逆に自装置固有の識別 I D等を通信相手に通知したりするといった、無線通信情報の通信を超近距離無線通信用アンテナを利用した無線通信によって行うようにした。従って、係めて近距離の通信となるので、装置のバスワードや識別情報を関係のない別の装置に伝送するといったことを低減すると共に、50

取得した無線通信馆報によって、近距離無線通信の開始 を容易に行うことが可能となり、セキュリティの向上及 び無線通信の開始までの時間を早めるのに役立つ。

【0022】また、本発明に係る閣求項12配銀の無額通信システムは、額求項1乃至請求項11のいずれかに配載の無線通信相をでうために必要な無線通信用情報の通信な、超近距離の無線通信によって行い、当該取得した無線通信情報を用いて前記通信相手と無線通信を行うことを特徴としている。つまり、請求項1乃至請求項11のいずれかに配載の無線通信を行うとを特徴としている。つまり、20作用して同数関同士で無線通信を行うシステムであり、その作用効果は重複するので記載を省略する。

【0023】また、本発明に係る請求項13記載の無線 適倡装置制御用プログラムは、請求項1記載の無線通信装 装置における無線通信処理を制御するための無線通信装 といまって超近距離無線通信処理を行う超近距離無線 題によって超近距離無線通信処理を行う超近距離無線 通信ステップと、前記近距離無線通信ステップと、前 配通信方式切り替え手段によって前配超近距離無線通信 ステップによる近距離無線通信処理との切り替え 通信ステップによる近距離無線通信 双手の方による近距離無線通信 現を行う通信処理切り替えステップと、を備えることを 特徴としている。

【0024】また、本発明に係る請求項14記載の無線 通信装置制御用プログラムは、請求項2記載の無線通信装 装置における無線通信処理を制御するための無線通信等 といよって超近距離の無線通信処理を行う超近距離無線 通信ステップと、前配り距離無線通信天シマ中距 種の無線通信処理を行う中距離無線通信ステップと、前 配通信方式切り替え手段によって前記超近距離無線 ステップによる超近距離無線通信の理との切り替えが 通信ステップによる中距離無線通信処理との切り替え処 理を行う通信処理切り替えステップと、を備えることを 特徴としている。

(10025)また、部次項15に係る発明は、額次項13又は額次項14配級の無額通信装置時間用プログラムにおいて、通信相手と前配超近距離以外の無線通信を行うために必要な無線通信を指していることを特徴としている。また、本発明に係る額次項16配銀の無線通信装置制御用プログラムは、額次項4配級の無線通信装置制御用プログラムは、額次項4配級の無線通信装置制御用プログラムは、額次項4配級の無線通信装置制御用プログラムは、額次項4配級の無線通信装置制御用プログラムは、額次項4配級の無線通信表置制御用プログラムは、前記無線通信手段によって前記無線通信列理を行う無線通信表置がで行われるデータ信号の無線通信の理を行う無線通信ステップと、前記接触式通信手段によって前記接触器を行う無線通信表示がでいて行われるデータ信号の通信処理を行う無線通信ステップと、前記接触式通信手段によって前記接触器を行う接触式通信ステップと、前記接触

記通信方式切り替え手段によって前記無線通信ステップ による無線通信処理と前記接触式通信ステップによる通 信処理との切り替え処理を行う通信処理切り替えステッ プと、を備えることを特徴としている。

プによる無線通信処理との切り替え処理を行う通信処理 **装置制御用プログラムであって、前配無線通信手段によ** って前記近距離無線通信用アンテナ及び前記超近距離無 面信相手と前記無線通信ステップにおいて行われる無線 通信処理に必要な無線通信情報の通信処理を、前配電磁 る無線通信処理を行う無線通信ステップと、自装置の前 している。また、本発明に係る請求項18配載の無線通 る前記データ信号の無線通信処理を行う電磁式通信ステ ップと、前記通信方式切り替え手段によって前配無線通 8 記載の無線通信装置制御用プログラムにおいて、前記 式通信ステップにおいて行うようになっていることを特 **泉通信装置制御用プログラムは、請求項6記載の無線通** 信装置における無線通信処理を制御するための無線通信 **腺通信用アンテナのうちいずれか一方を利用して行われ 記接触端子に他装置の接触端子が接触したときに、前記** 無線通信ステップにおいて行う無線通信処理を前記超近 距離無線通信用アンテナを利用した超近距離無線通信処 理に自動的に切り替える無線通信処理切り替えステップ 6 記載の無線通信装置制御用プログラムにおいて、通信 処理に必要な無線通信情報の通信処理を、前配接触式通 宮装置制御用プログラムは、請求項6記載の無線通信装 質における無粮通信処理を制御するための無粮通信装置 制御用プログラムであって、前記無線通信手段によって 前記無線通信用アンテナを用いて行われるデータ信号の 無線通信処理を行う無線通信ステップと、前記電磁式通 冒手段によってコイルを用いた電磁誘導によって行われ **扂ステップによる無線通信処理と前記電磁式通信ステッ** 徴としている。また、本発明に係る請求項20記載の無 **用手と前記無線通信ステップにおいて行われる無線通信** 冒ステップにおいて行うようになっていることを特徴と 切り替えステップと、を備えることを特徴としている。 【0027】また、請求項19に係る発明は、請求項1 【0026】また、請求項17に係る発明は、請求項1 と、を備えることを特徴としている。

[0028]また、請求項21に係る発明は、請求項2 0配数の無額通信装置制御用プログラムにおいて、前記 無線通信ステップにおいては、前記信号増幅部によって 前記アンテナから出力するデータ信号の増幅を行う信号 増幅処理を行うようになっていることを特徴としてい る。また、請求項22に係る発明は、請求項21記載の 無線通信制御用プログラムにおいて、前記無線通信不 ップにおいては、前記近距離無線通信用アンテナを用い た無線通信においてのみ前配信号増幅処理を行うように なっていることを特徴としている。

【0029】また、精求項23に係る発明は、請求項2 0乃至請求項22のいずれかに記載の無線通信装置制御

用プログラムにおいて、通信相手と前記無線通信ステップにおいて行われる無線通信処理に必要な無線通信的報の通信処理を、前配超近距離無線通信用アンテナを利用した無線通信ステップにおいて行うようになっていることを特徴としている。ここで、前求項 13乃至請求項 23配級の無線通信装置制御用プログラムは、請求項 1万至請求項 25 財政項 9 配級の無線通信装置における無線通信処理を制御するためのプログラムであり、その効果は重複するので配載を省略する。

[0030]

【発明の実施の形態】以下、本発明の実施の形態を図面に基づいて説明する。図1乃至図9は、本発明に係る無 最適信装置の実施の形態を示す図である。まず、本発明 に係る無段通信装置の第1の構成例を図1に基づいて説明する。図1は、本発明に係る無穏通信装置の第1の構成例を図1に基づいて説明する。図1は、本発明に係る無穏通信装置の第1の構成例を改すずプロック図である。図1に示すように、無額通信数置の第1の構成例1は、第1の無額制御部1aと、第1の無額通信用アンテナ1bと、第1の近距釋無報通信部1cと、接触通信用格子1dと、接触式通信部

と、第1の無弱通信用アンテナ1bと、第1の近距降無 級通信部1cと、接触通信用路子1dと、接触式通信部 20 1eと、第1の通信方式切り替え部1fと、第1の配億 第1gと、第1のCPU1hと、第1のROM11と、 第1のRAM1jと、第1のバス1kと、を備えた構成 となっている。 【0031】第1の無線通信制御部13は、無線通信処理を制御するもので、無級によるデータ信号の送信処理を制御するもので、無級によるデータ信号の送信処理の受び受信処理における伝送データの生成や、処理命令の伝送を行う。第1の無線通信用アンテナ1bは、近距離無線通信を行うためのアンテナである。第1の近距離無線通信部1cは、第1の無線通信用アンテナ1bから伝送用データを近距離に対して出力する処理を行うものであ

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(0032)投触通信用端子1dは、他技圏の同様の端子との技能によってデータを伝送するためのものである。技権式通信部1eは、接換通信用端子1dを介した他の通信機器との間のデータ送受信処理を行うためのもので、接触状態の監視や、データ伝送処理等の処理を行う。第1の通信方式切り替え部1fは、図示しない操作的の操作によって設定された通信モードに応じて、第1の近距離無鋭通信部1cによる近距離無鎖通信と、接触式通信部1eによる通信と、を切り替えて一方の処理だけを行う制御をするためのものである。

[0033] 第1の配億部1gは、無窮面倡や接触面周 用端子1dを介した通信によって送受信されるデータを記憶するためのものである。第1のCPU1hは、上記 各部の処理を削卸するための第1のROM11に記憶された制御用プログラムを実行するためのものである。第1のROM1は、上記した制御用プログラムを記憶している他に、装置固有の織別情報等を記憶している。

[0034] 第10RAM1 jd、第10CPU1 hv

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は、図4 (a) に示すように、第1の無線通信装置40 よって行われる。本実施の形態においては、この接触通 信用端子による超近距離無線通信によって、近距離無線 通信を行いたい通信相手と通信を行うために必要な通信 1の第2の接触通信用端子41aとを接触させることに の第1の接触通信用端子40aと第2の無線通信装置4 【0035】まず、接触通信用端子1dを用いた通信 用情報の送受信が行われることになる。

ROM11に記憶された装岡固有の識別情報や、近距離 から読み出され、伝送処理が行われる。そして、この通 宮によって通信相手の通信情報を取得すると、第1の通 距離無線通信部1 cは、取得した通信相手の通信情報に 距離無収通信処理を行う。なお、これら各部の処理は第 【0037】更に、無穀通信装置の第1の構成例1にお 制御用プログラムの動作処理を示すフローチャートであ 無線通信のプロトコル等の情報が送受信されるようにな **信方式切り替え部1 f によって、接触式通信部1 e によ** cによる近距離無線通信方式へと通信方式の切り替えが cによる近距難無線通信方式に切り替わると、第1の近 **数類処理等を施した後に、図4(b)に示すように、自** 装置のアンテナから変調されたデータ信号を出力する近 1のCPU1hによって第1のROM1iに記憶されれ する。図7は、無粮通信装置の第1の構成例1における し、図示しない操作部によって通信方式を接触式通信部 [0036] 更に、通信用情報としては、予め、第1の っており、接触式通信部1cによって第1のROM1 I る超近距離無線通信方式から第1の近距離無線通信部1 ける制御プログラムの動作の流れを図7に基づいて説明 行われる。更に、通信方式が第1の近距離無線通信部1 基づき、伝送するデータを第1の配憶部から読み出し、 た制御用プログラムを実行することによって行われる。 る。図7に示すように、まずステップ5700に移行

[0038] ステップS702では、第1の通信方式切 り替え部1Fによって、通信方式が通信用接触端子を用 いた通信方式になるように切り替え処理が行われステッ と、接触式通信部16による通信処理が開始されステッ プS704に移行する。ステップS704に移行する

1 6による通信用接触端子を用いた超近距離無線通信モ

ドに散定しステップS702に移行する。

存開2003-188805

接触したか否かを判定し、接触したと判定された場合(Y **冒用端子 1 dが他の通信装置の同様の接触通信用端子と** zs)はステップS708に移行し、そうでない場合(No) は、接触するまで待機する。

施の形態においては、通信用情報は、自装置のものも通 信相手に伝送し、両者が互いの通信用情報を有した状態 【0039】ステップS708に移行した場合は、接触 に、通信相手からの通信用情報を取得したか否かを判定 通信用情報を取得するまで処理を続ける。ここで、本実 ップS710に移行し、そうでない場合(No)は接触して 通信情報を取得したと判定された場合(Yes)はステ が確認されたので、通信情報の送受信処理を行い、更 となってから次のステップに移行するようになってい کہ

【0040】ステップS710に移行した場合は、通信 方式が自動的に近距離無線通信モードに散定されステッ プS712に移行する。ステップS712では、第1の 距離無線通信部1 cによる近距離無線通信方式となるよ の近距離無線通信部1cが、伝送するデータを第1の記 億郎Igから説み出して、そのデータ信号を撤送彼と合 通信方式切り替え部1「によって、通信方式が第1の近 cにより、第1の無線通信用アンテナを用いた近距離無 る。ステップS714では、第1の近距離無線通信部1 **泉通信が開始される。ここで、近距離無線通信は、第1** うに切り替え処理が行われステップS714に移行す

構成例を図2に基づいて説明する。図2は、本発明に係 ナ2と、第2近距離無線通信部2と、無線通信用コイル 替え部2fと、第2の記憶部2gと、第2のCPU2h【0041】更に、本発明に係る無線通信装置の第2の る。図2に示すように、無線通信装置の第2の構成例2 2 dと、電磁式無線通信部2 eと、第2の通信方式切り と、第2のROM21と、第2のRAM21と、第2の は、第2の無線制御部2aと、第2の無線通信用アンテ 無線通信用アンテナ1bから出力することで行われる。 る無線通信装置の第2の構成例を示すプロック図であ

【0042】第2の無線通信制御部2aは、無線通信処 及び受信処理における伝送データの生成や、処理命令の 無線通信部2cは、第2の無線通信制御部2aからの命 理を制御するもので、無線によるデータ信号の送信処理 伝送を行う。第2の無線通信用アンテナ2bは、近距離 の無線通信を行うためのアンテナである。第2の近距離 **令に応じて、第2の無線通信用アンテナ2bから伝送用** データを近距離に対して出力する処理を行うものであ パス2kと、を備えた構成となっている。

通信用コイル2 dによる電磁誘導を利用してデータを他 するためのものである。電磁式無線通信部2eは、無線 【0043】無様通信用コイル2dは、回様のコイルと の接近によって電磁誘導を引き起こしデータを無線伝送

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プS106に移行する。ステップS106では、接触通

無線通信部2cによる近距離無線通信と、電磁式無線通 の通信方式切り替え部2~は、図示しない操作部の操作 冒部2eによる超近距離無線通信と、を切り替えて一方 の処理だけを行うようにする制御をするためのものであ の通信機器に伝送するための処理を行うもので、電磁誘 導によってデータを送受信するための処理を行う。第2 によって散定された通信モードに応じて、第2の近距離

ンテナ2bを用いた近距離無線通信や無線通信用コイル 2 dを用いた超近距離無額通信によって送受信されるデ ある。第2のROM21は、上記した制御用プログラム 【0044】第2の記憶部2gは、第2の無線通信用ア に記憶された制御用プログラムを実行するためのもので を記憶している他に、装置固有の識別情報を記憶してい ータを記憶するためのものである。第2のCPU2h は、上配各部の処理を制御するための第2のROM2

憶するためのものである。第2のバス2kは、上配各部 [0045]第2のRAM2 | は、第1のCPU2hが に、より具体的な動作を、図5に基づいて説明する。図 る第2の無粮通信用アンテナ2bを用いた無粮通信の様 上記制御用プログラムを実行する際に必要なデータを記 いる様子を示す図であり、(a) は、電磁式通信部2 e 図であり、(b)は、第2の近距離無線通信部2cによ 5 は、同タイプの通信装置同士による無線通信を行って による無線通信用コイル2dを用いた通信の様子を示す 間のデータ通信を行うためのデータ通信路である。次

\$ S は、図5 (a) に示すように、第3の無線通信装置50 は、無線伝送を行うために変調処理等が行われ、無線通 [0046] まず、無線通信用コイル2dを用いた通信 の第1の出力部50aと第4の無線通信装置51の第2 よって行われる。本実施の形骸においては、この無頼通 て、対象の通信相手と近距離無線通信を行うために必要 な通信情報の送受信が行われることになる。通信情報と ようになっており、電磁式無線通信部2 eによって、第 の出力部51 a とを通信可能な距離まで近づけることに しては、予め、第2のROM21に記憶された装置固有 の識別情報や、通信のプロトコル等の情報が伝送される 信用コイルによる電磁誘導を利用した無線通信によっ 2のROM21から読み出された通信用情報のデータ 信用コイル2dを介して相手先に伝送される。

わると、第2の近距離無線通信部2cは、超近距離無線 [0047] そして、電磁式無線通信部2eによる超近 と、第2の通信方式切り替え部2Fによって、電磁式無 線通信部2 eによる超近距離無線通信方式から第1の近 方式の切り替えが行われる。更に、通信方式が第2の近 距離無線通信部2cによる近距離無線通信方式へと通信 距離無線通信部2cによる近距離無線通信方式に切り替 距離無線通信によって通信相手の通信情報を取得する

通信によって取得した通信相手の通信情報に基づき、伝 **理等を施した後に、図5(b)に示すように、自装置の** PU2hによって第2のROM2iに配儀されれた制御 将開2003-188805 送するデータを第2の記憶邸2gから競み出し、変調処 アンテナから変調されたデータ信号を出力する近距路無 腺通信処理を行う。なお、これら各部の処理は第2のC

用プログラムを実行することによって行われる。

【0048】更に、無線通信装置の第2の構成例2にお る。ステップS806では、無線通信用コイル2dが他 ける制御プログラムの動作の流れを図8に基づいて説明 制御用プログラムの動作処理を示すフローチャートであ 【0049】ステップS802では、第2の通信方式切 する。図8は、無線通信装置の第2の構成例2における し、図示しない操作部によって通信方式を配磁式無規通 信部2eによる無板通信用コイル2dを用いた超近距離 り替え部2「によって、通信方式が無線通信用コイル2 dを用いた超近距離無線通信方式になるように切り替え 804に移行すると、電磁式無線通信部26による超近 距離無線通信処理が開始されステップS806に移行す の通信装置の同様の無線通信用コイルとの電磁誘導によ 処理が行われステップS804に移行する。 ステップS 動したと判定された場合(Yes)はステップS808に移 行し、そうでない場合 (No)は、範囲内に移動するまで 無線通信モードに散定しステップS802に移行する。 る。図8に示すように、まずステップS800に移行 り無線通信可能な範囲内に移動したか否かを判定し、

を行い、更に、通信相手からの通信用情報を取得したか 自装間のものも通信相手に伝送し、両者が互いの通信用 【0050】ステップS808に移行した場合は、範囲 **内への移動が確認されたので、通信用情報の送受信処理** 否かを判定し、通信情報を取得したと判定された場合(V は範囲内に移動し通信用僧報を取得するまで処理を続け **背報を有した状態となってから次のステップに移行する** es)はステップS810に移行し、そうでない場合(No) る。ここで、本実施の形態においては、通信用情報は、 ようになっている。

待機する。

子を示す図である。

成する変調処理を行い伝送用データに変換して、第1の

cによって、第2の無線通信用アンテナ2bを用いた近 画信方式切り替え邸2 f によって、通信方式が第2の近 る。ステップS814では、第2の近距離無線通信部2 第2の記憶部2gから読み出して、そのデータ信号を撤 【0051】ステップS810に移行した場合は、通信 方式が自動的に近距離無線通信モードに散定されステッ プS 8 1 2 に移行する。ステップ S 8 1 2 では、第2の 距離無線通信部2cによる近距離無線通信方式となるよ は、第2の近距離無頼通信部2cが、伝送するデータを 距離無線通信が開始される。ここで、近距離無線通信 送彼と合成する変調処理を行い伝送用データに変換し うに切り替え処理が行われステップS 8 1 4 に移行す

て、第2の無検通信用アンテナ2bから出力することで

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アンテナ3dと、アンテナ切り替え邸3eと、信号増幅 第3のROM31と、第3のRAM3jと、第3のパス (0052) 更に、本発明に係る無線通信装置の第3の 開成例を図3に基づいて説明する。図3は、本発明に係 超近距離無線通信用アンテナ3cと、近距離無線通信用 る。図3に示すように、無极通信装置の第3の構成例3 部3 f と、第3の配憶部3 g と、第3のC P U 3 h と、 る無線通信装置の第3の構成例を示すプロック図であ 第3の無線通信制御部3aと、無線通信部3bと 3 k と、を描えた構成となっている。

陽子が接触したときに行われる通信相手と超近距離無線 又は、近距離無線通信用アンテナ3dを利用して無線通 信を行うもので、第3の無線通信制御部3aか5の制御 【0053】第3の無額通信制御邸3aは、無線による データの通信処理を制御するものであり、送信処理、又 命令に基づいて処理を行う。超近距離無線通信用アンテ ナ3cは、図示しない自装間の接触端子に他装置の接触 受信処理の制御や、通信用データの生成等を行う。 無線通信部3 bは、超近距離無線通信用アンテナ3 c、 通信を行うためのアンテナである。

る。アンテナ切り替え部3cは、自装置の接触端子に他 【0054】近距離無線通信用アンテナ3dは、目的の 装置の接触端子が接触したときに自動的にアンテナを超 近距離無線通信用アンテナ3cに切り替え、近距離の無 **椒通信を行うときに近距離無粮通信用アンテナに自動的** に切りかえる処理を行うものである。ここでは、接触端 子の接触の有無及び通信情報の取得状況に応じてアンテ 通信相手と近距離無頼通信を行うためのアンテナであ ナを自動的に切り替えるようになっている。

信用アンテナ3cを利用した超近距離無額通信を行う場 っている。第3の配億即3gは、超近距離無線通信及び る。ここで、本実施の形態においては、超近距離無頼通 【0055】信号増幅部3「は、近距離無線通信用アン 合は、信号を増幅せずにアンテナから出力するようにな 近距離無線通信によって送受信されるデータを記憶する テナ3 dから出力する信号を増幅するためのものであ ためのものである。

卸するための第3のROM3 1 に記憶された制御用プロ は、上記した制御用プログラムを記憶している他に、装 紀制御用プログラムを実行する際に必要なデータを記憶 間固有の臨別情報や、パスワード等の通信用情報を記憶 している。第3のR AM3 | は、第3のC P U 3 hが上 【0056】第3のCPU3hは、上記各部の処理を制 グラムを実行するためのものである。第3のROM3 1 するためのものである。

を有する同タイプの通信装置同士による無線通信を行っ な動作を、図6に基づいて説明する。図6は、接触端子 【0057】 第3のバス3kは、上記各街国のデータ通 信を行うためのデータ通信路である。次に、より具体的

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ている様子を示す図であり、(a)は、超近距離無線通

示す図であり、(b)は、近距離無線通信用アンテナ3 り替え部36に伝送する。ここで、自装置の接触端子が 替え部3mよって超近距離無線通信用アンテナ3cを aはこのモード散定に応じて、モード情報をアンテナ切 他装置の接触端子と接触している場合は、アンテナ切り 選択する処理を行う。 本実施の形態において無線通信部 3 bは、超近距離の無線通信であれば、信号増幅部3 f を介さずに、伝送用データ(ここでは通信用情報)の送 **信用アンテナ3cを利用した超近距離無線通信の様子を** 無粮通信モードの散定を行う。 第3の無線通信制御部3 【0058】まず、図示しない操作部の操作によって、 dを利用した近距離無線通信の様子を示す図である。 信処理を行うことになる。

【0059】一方、自装爾の接触端子が他装置の接触端 子と接触してらず、且つ、通信情報が取得済みである場 f において送信用のデータ信号を増幅させて近距離無線 合は、アンテナ切り替え部36は、近距離無線通信用ア ノテナ3 dを選択し、無線通信部3 bは、信号増幅部3 通信用アンテナ3dから伝送用データ信号を出力する。

つまり、超近距離無線通信用アンテナ3cを用いた通信 は、図6 (a) に示すように、第5の無線通信装置60 の第3の接触通信用端子60aと第6の無線通信装置6 1の第4の接触通信用端子61aとを接触させることに **騅無粮通信によって、対象の通信相手と近距離無線通信** を行うために必要な通信用情報の送受信が行われること になる。通信用情報としては、予め、第3のROM2! に配憶された装岡固有の識別情報や、通信許可を得るた よって行われる。本実施の形態においては、この超近距 めのパスワード等の情報が伝送されるようになってお

によって近距離無線通信用アンテナ3 dが選択され、図 して近距離無線通信用アンテナ3 dから、増幅された信 り、第3の無模通信制御部3aによって、第3のROM 【0060】そして、通信用情報を取得し、通信相手と 近距離無锒通信を行うときは、アンテナ切り替え即3 e 6 (も) に示すように、第5の無線通信装置60と第6 状態にあり、無線通信部3bにより信号増幅部3Fを介 3 1 から読み出された通信用情報のデータは、無線伝送 を行うために変調処理等が行われ、無線通信部3bによ の無線通信装置61とは近距離の範囲内で互いに離れた って超近距離無線通信用アンテナ3cから出力される。 号を出力することで近距離無線通信が行われる。

【0061】更に、無線通信装置の第3の構成例3にお 明する。図9は、無線通信装置の第3の構成例3におけ る制御用プログラムの動作処理を示すフローチャートで ある。図9に示すように、まずステップ5900に移行 し、接触端子向士の接触があったか否かを判定し、接触 ける制御プログラムの動作の流れを図10に基づいて説 があった場合(Yes)はステップS 9 0 2 に移行し、そう でない場合(No)はステップS 9 0 8 に移行する。

【0062】ステップS902に移行した場合は、アン テナ切り替え部3eによって、超近距離無線通信用アン テナ3cが選択されステップS904に移行する。ステ **倒近距離無線通信用アンテナ3cを利用した超近距離無 腺通信を行いステップS906に移行する。ステップS** 906では、無線通信が終了したか否かを判定し、終了 したと判定された場合(Yes)は通信処理を終了し、そう ップS904に移行すると、無粮通信部3bによって、

[0063] 一方、ステップS900で、被触端子の扱 動がなくステップS908に移行した場合は、通信用情 泉通信用アンテナ3 dを選択してステップ S 9 1 2 に移 頼を取得しているか否かを判定し、取得していると判定 ない場合(No)はステップS900に移行する。ステップ S 9 1 0 に移行すると、アンテナ切り替え部 3 e によっ て、無線通信部3bの利用するアンテナとして近距離無 された場合(Yes)はステップS 9 1 0に移行し、そうで でない場合(No)はステップS900に移行する。

よって、近距離無線通信用アンテナ3 dを利用した近距 L記実施の形態によれば、無線通信を行う際に、通信装 [0064] ステップS912では、無极通信部3bに **難無線通信を行いステップS906に移行する。以上、**

装置にそれらの情報が受信されることを低減することが **習固有の識別データや、パスワードの送受信を超近距離** の無線通信によって行うようにしているので、無関係な 可能となるのでセキュリティの向上に役立つ。

できるので無線通信開始までの時間を短縮することが可 **通信によって通信用情報を取得するようにした第1の構** 成例1では、簡易、且つ、迅速に通信用情報を取得する ことができるので無線通信開始までの時間を短縮するこ とが可能である。また、無線通信用コイル2dによる超 近距離通信によって通信用情報を取得するようにした第 2の構成例2では、簡易に通信用情報を取得することが 【0065】また、接触通信用端子1dによる超近距離 能である。

距離無線通信用アンテナに自動的に切り替えて通信を行 【0066】また、接触端子の接触の有無に応じて、通 3の構成例3では、接触端子の接触があったときに超近 うので、簡易、且つ、迅速に通信用情報を取得すること 便利である。また、第3の構成例3では、超近距離無線 信号を増幅せずにアンテナから出力するようにしている **言に使用するアンテナの種類を切り替えるようにした第** ができ無線通信開始までの時間を短縮することができ、 **通信用アンテナを利用した超近距離無線通信のときは、** ので、消費電力の低減となる。

ンテナ16は、請求項4記載の無線通信用アンテナに対 **信処理は、請求項1記載の近距離無線通信手段及び請求** a 及び第1の近距離無線通信部1 c による近距離無線通 項4配載の無線通信手段に対応し、第1の無線通信用ア [0067] ここで、図1に示す、第1の無観制御部1

将開2003-188805

9

配載の接触式通信手段に対応し、第1の通信方式切り替 に対応し、接触式通信部1eは、請求項4及び請求項5 広し、接触通信用端子1dは、請求項4配級の接触端子 え部1「は、請求項1、4、5配載の通信方式切り替え 手段に対応している。

切り替え部2 f は、請求項1、4、6 配載の通信方式切 及び第2の近距離無線通信部2cによる近距離無線通信 6、7配載の無線通信手段に対応し、第2の無線通信用 アンテナ2 bは、請求項6配載の無線通信用アンテナに ルに対応し、電磁式無銀通信部26は、請求項6及び請 **求項7 記載の電磁式通信手段に対応し、第2の通信方式** 【0068】更に、図2に示す、第2の無線制御部2a 処理は、請求項1記載の近距離無線通信手段及び請求項 対応し、無線通信用コイル2dは、請求項6配載のコイ り替え手段に対応する。

【0069】更に、図3に示す、第3の無線通信制御部 | 1 配載の無線送信手段に対応し、アンテナ切り替え部 3 a 及び無線通信部3bによる無線通信は、翻求項8~ 3 dは、精水項8配載のアンテナ切り替え手段に対応し

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信用アンテナを用いた近距離~中距離の無線通信と、超 近距離無線通信とを通信方式切り替え手段によって任意 項1乃至請求項7記載の無線通信装置によれば、無線通 の方式に切り替え可能としたので、通信用途に応じた通 [発明の効果] 以上説明したように、本発明に係る請求 **宮方式の使い分けができ、消費配力の低減が可能であ**

り、超近距離通信によって無線通信に必要な通信用情報 を取得してから無線通信を開始するようにしたので、無 関係な装置への情報送信を低減すると共に、通信開始ま での時間短縮が可能となる。

での時間短縮が可能となり、更に、超近距離無線通信の で、超近距離通信によって無線通信に必要な通信用情報 【0071】また、請求項8乃至請求項11記載の無線 通信装置によれば、アンテナ切り替え手段によって、通 ンテナの種類を超近距離無線通信用アンテナと近距離無 **原通信用アンテナとのいずれかに切り替え可能としたの** を取得してから無線通信を開始するようにしたので、無 ときには信号を増幅せずにアンテナから出力するように **冒方式はそのままに、接触端子の接触の有無に応じてア** 関係な装置への悄観送信を低減すると共に、通信開始ま したので、消費電力の低減に役立つ。

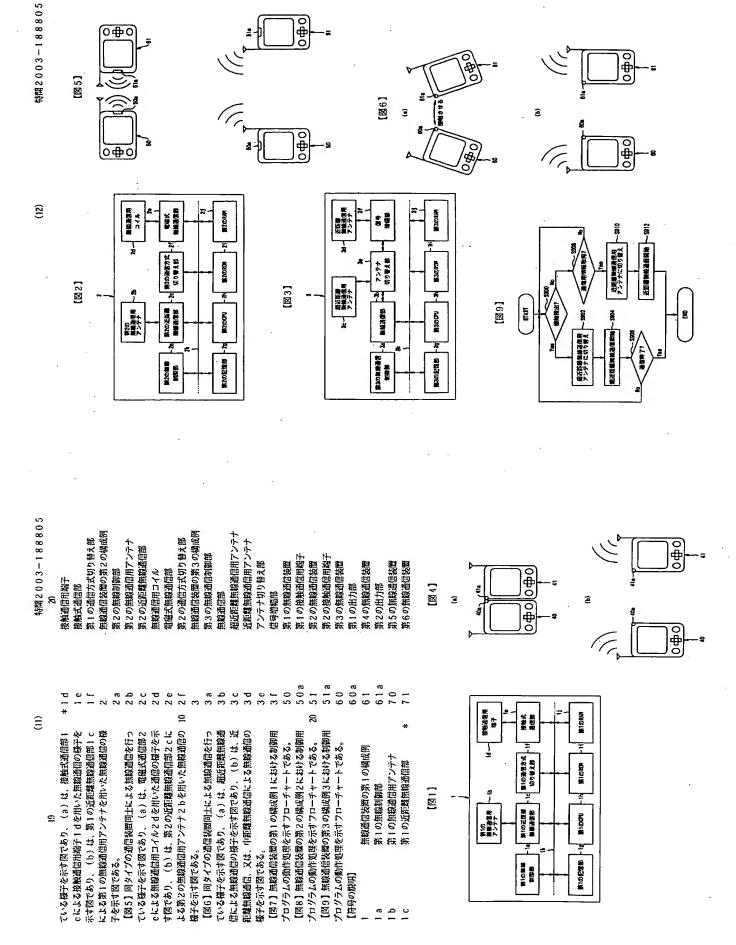
【図面の簡単な説明】

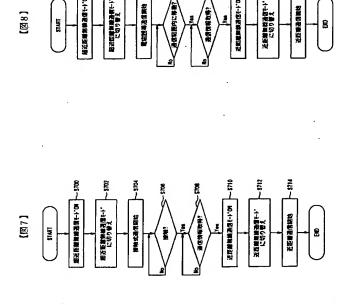
【図1】本発明に係る無線通信装置の第1の構成例を示 すプロック図である。

【図2】本発明に係る無線通信装置の第2の構成例を示 すプロック図である。

【図3】本発明に係る無線通信装置の第3の構成例を示 すプロック図である。 【図4】同タイプの通信装置同士により無頼通信を行っ

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フロントページの結婚

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